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ABSTRACT

This document presents the president's report of the progress of the University of Arizona, 1963-1973. Following the president's message, emphasis is placed on a description of the university; a historical description of each of the colleges within the university; the significance and review of university research activities; and the special services the university provides to the students, the community, the state, and the nation. (Author)

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A DECADE OF PROGRESS, 1963-1973

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This report contains a brief description of the University of Arizona. It is a textual and visual picture of the University today, augmented by a glimpse of its dynamic growth during the past decade.

As dramatic as this development has been, the University's real goal is the attainment of that excellence which is the hallmark of every great university. It is not enough to be a good land-grant institution. The University of Arizona must be one of the very best.

Mindful of its historic mission of instruction, research and service, the University will strive for quality, though quantity may indeed follow in its wake. If I may paraphrase Browning, our reach must always exceed our grasp. We will seek to achieve superiority in each endeavor which properly engages us.

I hope I will be forgiven a personal note in this, my first general report to the University's constituency. I am mindful of all who have contributed to this school in the past as well as those thousands who serve it so well today. I am uniquely indebted to those who have previously presided over the destiny of this institution. Special tribute is due my immediate predecessor, Dr. Richard A. Harvill, who with distinction guided the University's fortunes for two decades immediately prior to my assumption of the presidency on July 1, 1971.

This University consists of many persons: students, faculty, Regents, alumni, legislators, and countless friends. It has vast cultural and physical resources. Yet it is far greater than the sum of all its parts. It is living testimony both to past accomplishments and tomorrow's brightest hopes.

The University must not only reflect and serve the society from which it springs. It must strengthen the fabric of that society and improve the very quality of our lives. It is a sacred trust, a torch to be lifted high, renewed, enlarged, and passed on to each succeeding generation.

John P. Schaefer
President

JOHN P. SCHAEFER
PRESIDENT, UNIVERSITY OF ARIZONA

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II. THE UNIVERSITY TODAY

The University of Arizona is a major institution of higher learning in the fastest growing state in America. It is the land-grant college of Arizona. With its 14 colleges, 5 schools and many special divisions of research and service, it is the most complete university in the arid or semiarid area of the world. Its objectives are teaching, research and public service, all of which are inexorably interwoven with one another.

For example, the improvement of skills and talents through instructional programs is clearly a public service, as is the creation of new knowledge through research, some of which may provide immediate economic benefits. One necessarily becomes a more effective teacher by keeping involved in his field; this may or may not entail publishing or performing research. But there are very few areas in the University in which research is not helpful. The three goals of the University — teaching, research and service — indeed complement each other.

The University is a mirror of the society in which we live. More than three-quarters of the student body come from Arizona. Other students from over eighty different nations and every state in the Union help make the University less insular and more cosmopolitan, adding notably to the educational experience that is offered.

The hallmark of any great university is the *quality of its faculty*. Significant strides continue to be made toward the attainment of that mark of excellence. The real story of the University in recent years lies in the superior faculty that has become a part of our ranks. Distinguished faculty members not only make their own invaluable contributions, but also attract other notable scholars, many on the junior level.

The University faculty represents a broad range of excellence and a high level of commitment to that excellence in teaching, research and public service. Many University faculty members have achieved national and worldwide eminence in their fields; from Antarctic exploration and interplanetary optical surveys to the discovery of tree-ring chronology; from the construction of sea-water desalting facilities to the reconstruction of Shakespeare's theaters. A dozen professors are members of the National Academy of Sciences. A Nobel Prize winner will join the faculty next year. The faculty at the University of Arizona is now recognized as a national resource and has achieved international recognition in many areas.

Effective teaching remains the primary goal of the University; scholarship and research are principal means to this end. Various organizations encourage and recognize faculty members for outstanding teaching through special awards, honorariums, and grants.

Video tapes and recorders are available so that faculty members may evaluate themselves in order to improve future lectures. Students periodically publish an evaluation of faculty members. Comparison of the effectiveness of teaching methods is monitored through students' grades. These and other approaches are constantly being used to help in the delivery of high quality instruction to the student body.

Student advising, teaching, research and service are common tasks for nearly all faculty members, but the emphasis on each varies considerably from professor to professor. Some spend most of their time on research — working in libraries or laboratories, observing the stars or digging in archaeological ruins. Others are especially involved with undergraduate teaching. Many are engaged in projects far removed from the campus.

Although a large institution, the University attempts to maintain a close faculty-student relationship in a number of ways. Each student has an advisor throughout his entire time at the University. Many departments have individual counseling and special tutorial sections for students. From preregistration by mail to use of the most modern electronic devices, every effort is made to help the student learn. Teaching machines, cassettes, tape recorders and a host of other equipment are used to improve the learning process. Many different forms of the latest computer instruction are in effect; this includes the mammoth CDC 6400 University computer, as well as minicomputers for classrooms. Both closed and open circuit television is used for instruction. The College of Engineering has even developed a Microcampus whereby video-cassettes are used to conduct continuing education classes far from the campus. Imaginative innovation is being used to make instruction exciting, interesting, and effective.

The University's continued curricular growth has witnessed a rapid increase of interdisciplinary programs. Through these, the University is attempting to reduce the fragmentation of knowledge and show the interrelationships that exist in various branches of learning. This interdisciplinary approach reflects the cooperative efforts of many departments and colleges. Some current programs include those in biomedical engineering, criminal justice, environmental studies, genetics, gerontology, human nutrition, Latin American studies, linguistics, statistics, toxicology, and urban planning.

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Today's students are far more interested in such matters as curriculum and excellence of instruction than were those of the sixties. The turbulence of that decade spread all over the country and then finally subsided, leaving much destruction in its wake. The University had its share of students objecting to the establishment, passionately espousing various causes, and generally hostile to any sort of authority. But little or no violence ensued.

Channels of communication between students, faculty and administration have been recently widened. A new office of Vice President for Student Relations was created last year. It provides for quick and open communication by giving students ready access to the highest councils of the administration. Students still become involved in various campaigns, want "relevancy" in their classes, concern themselves with environmental and many other societal problems, but express their goals in rational ways. They have seen that many of their objectives, such as liberalization of rules for students living on campus, and dropping of compulsory R.O.T.C., have been attained by working through accepted channels. Today's attitudes and actions of students reflect a stability and maturity unmatched since the days of World War II veterans.

This is not to say that intellectual ferment and vocal dissent have disappeared from the campus. This is not and should never be the case. But a general sense of warmth, understanding and seriousness marks students' behavior now. They simply reflect an increasingly intellectual, emotional and psychological maturity that augurs hopefully for their development and future achievements. This is a valuable asset to any university which aspires to greatness.

a

b

a *Dr. Richard A. Harvill*
President of the University (1951–1971)
President, National Association of State Universities and Land-Grant Colleges (1969–1970)

b *Dr. Francis A. Roy*
Dean of the College of Liberal Arts (1951-1970)

c *Environmental Laboratory greenhouse, Sheikdom of Abu Dhabi on Arabian Gulf*

d *Dr. Albert B. Weaver*
Executive Vice President

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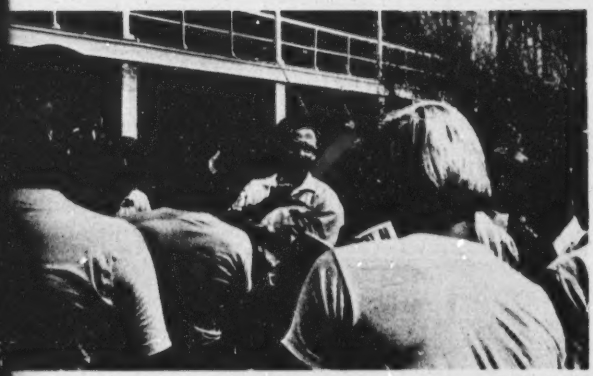

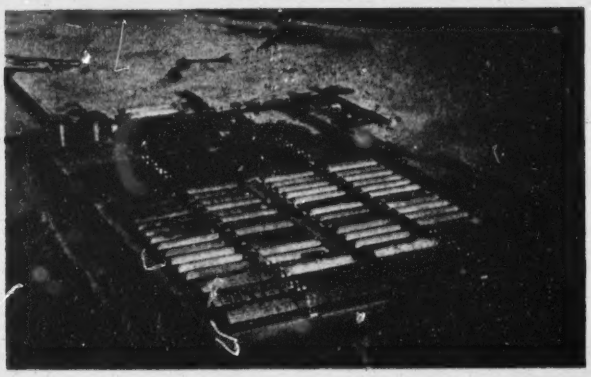

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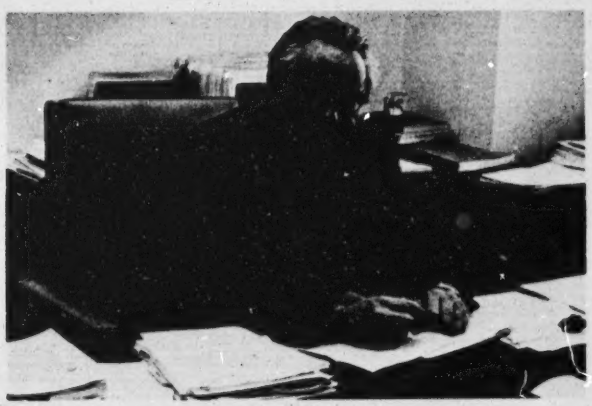

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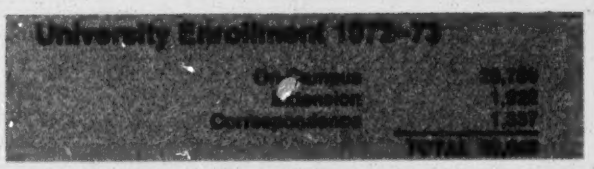

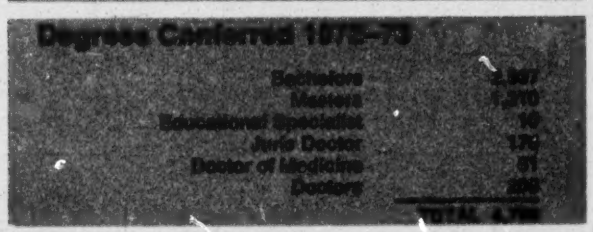

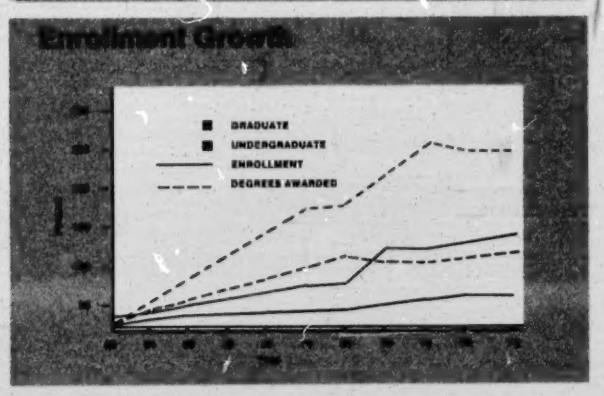

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III. THE ACQUISITION OF KNOWLEDGE

THE COLLEGE OF AGRICULTURE

The College of Agriculture was one of the four original divisions of the University when it was established in 1885. Since then the College has led virtually every agricultural advance in Arizona, and in turn has attempted to meet the changing needs of Arizona farmers and ranchers. No college at the University has more direct relationship with the people and economy of Arizona than Agriculture. The College itself is divided into four main branches: Resident Instruction, the Agricultural Experiment Station, the Cooperative Extension Service, and the School of Home Economics.

Agriculture today is a complex and rapidly changing industry. No longer do thousands of small farms exist in Arizona. Many of these have disappeared. Others have become large businesses. Although there are many large agribusinesses in Arizona, especially in the Maricopa area, there has lately been a trend back to smaller farms and ranches. The preparation of persons to manage these various enterprises is no mean task. This has meant that the University's offerings in agriculture have had to be very flexible, covering a wide spectrum of subjects.

The College of Agriculture reflects changes and concerns of our society with increased interest in the areas of renewable natural resource management, including land-use planning, regional design, systems analysis and agricology. Traditional programs in production and marketing, family living, community development and youth work continue. But during the past decade the scope of offerings has vastly increased. New programs are being offered in communication skills, natural resources, recreation, food science, turf grass management, plant protection, environmental quality, and international aid.

The Agriculture curriculum offers a broad knowledge of agriculture itself along with areas of general information giving the student a foundation in natural sciences, social sciences and communication skills upon which to develop a working knowledge of scientific agriculture. More than forty fields of study are available for agricultural majors — from communications and economics to water resources and ecology. No college involves more interdisciplinary approaches than Agriculture. The preparation of a specialist in agriculture involves programs in many closely allied fields.

The College of Agriculture during the past decade has received requests for help from all parts of the world. Since Arizona is the most complete university in the semiarid region of the world, peoples from developing countries in similar regions have come to it for guidance. Hundreds of foreign students are studying agriculture here. The College of Agriculture is presently participating actively in two overseas technical assistance projects, with some aid being given in two others.

The Brazil Program, which has been in effect for ten years, represents a contract between the University of Arizona, the U. S. Agency for International Development, and the University of Ceará in Fortaleza, Ceará, Brazil. The objectives are to adapt the philosophy of the U. S. land-grant college to Brazil and thus assist the University of Ceará in becoming a regional focus for stimulating agricultural production and improving rural life. University of Arizona faculty members in various agricultural disciplines serve at the University of Ceará. University of Ceará faculty members are studying for advanced degrees at the University of Arizona and visiting various agricultural operations throughout the country.

Other aid is being given to Turkey, with various agricultural experts from the University helping establish that country's agricultural policies. A similar program is now being designed for Iran. Mexico for years has been aided by all sorts of exchanges with University agricultural experts. Involvement in these foreign programs, with their faculty interchange, coupled with the many foreign students here studying agriculture, has had the expected results on our own students. Their academic experiences have not only been enriched, but they have come to realize how closely related their own activities and problems are to others around the world.

These on-campus programs are enhanced by the College's research and service arms, the Agricultural Experiment Station and the Cooperative Extension Service. There is an almost constant flow to the campus of persons concerned with Arizona agriculture: Future Farmers of America, 4-H Club members, Town and Country Life conferees, Winter Extension School students, and scores of similar organizations. Many state and national commodity groups — including dairy, meat, food science, landscape architecture and others — hold annual meetings on the University campus. This constant exchange between on-campus teachers and students, and Arizona and national agriculturists, is beneficial in many ways.

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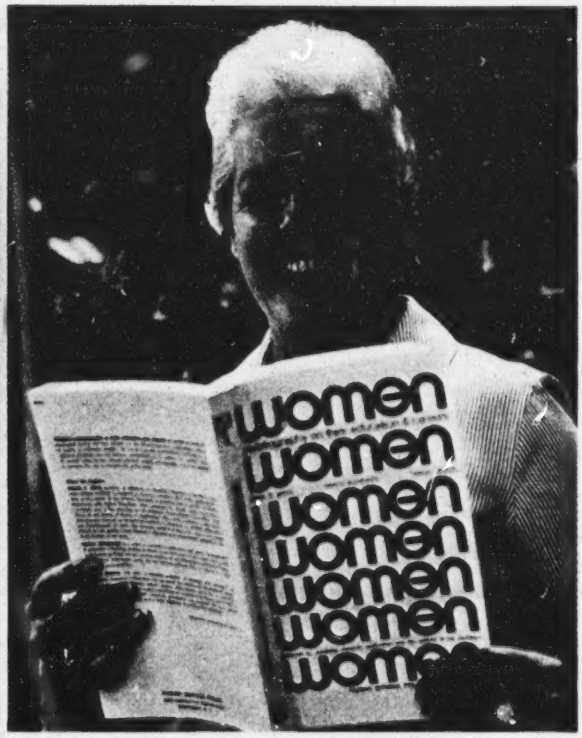

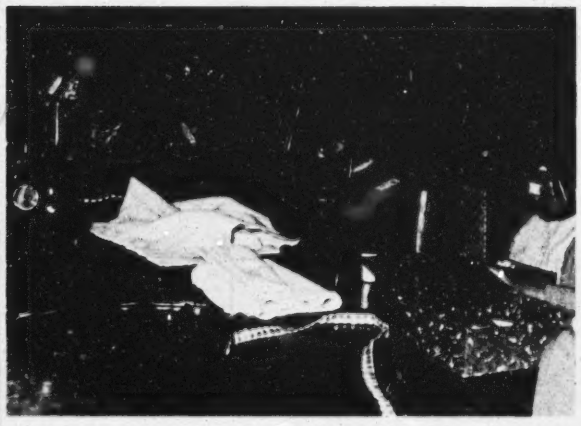

The School of Home Economics has three chief objectives: general education for personal and family living, specialization in various aspects of home economics in preparation for professional positions, and courses to enrich the professional preparation of students in other colleges. Its five major divisions are: Child Development and Family Relations; Food, Human Nutrition and Dietetics; Family Economics and Home Management; Clothing, Textiles, and Interior Design; and Home Economics Education.

The School itself has increased both in numbers of students and faculty during the past decade. There are home economists stationed in each of Arizona's fourteen counties who work closely with regular extension agents and home economics instructors on the campus. Dr. Ruth Hall, Director of the School, was president of the 50,000 member American Home Economics Association during 1964–66. President-elect of the Association is Mrs. Margaret Edsel Fitch, currently State Leader Home Economics Extension.

The College of Agriculture's modern and flexible approach to scientific agriculture is obviously successful. In an era when the farm population has shrunk enormously, the College's undergraduate enrollment has increased by 200 percent the last few years, its graduate enrollment almost 400 percent! Thus the College of Agriculture is growing. It is certainly attempting to respond to the shifting needs of the ranchers, farmers and other agricultural interests of Arizona.

a *Dr. Wallace Fuller, Dean Herbert Rhodes, Dr. Bahe Billy, and Dean Harold Myers*

b *Dr. Ruth C. Hall*
Director, School of Home Economics
President, American Home Economics Association (1964–66)

c *4-H Club members learning to make their own clothes*

d *Extension Home Economists help Arizona homemakers prepare more nutritious diets*

THE COLLEGE OF ARCHITECTURE

The University offered its first architecture course in 1958. The Department of Architecture became a separate college in 1964. The College's task is to prepare students for the general practice of architecture in Arizona and indeed throughout the Southwest. The architecture program at the University has grown dramatically. Student enrollment totaled 200 majors in 1963. The College now has more than 400 majors, despite higher entrance standards and increased selectivity in student admissions. The five-year bachelor of architecture program has been augmented by a master's for those qualified to continue into specialized architectural study and related environmental design fields.

Architecture is a discipline that flourishes on the frontiers of change, since designs are always prepared for some future context. It is also a profession that has redefined its role in society over the past decade. Ten years ago it actually predated and predicted the current "urban and environmental crisis." At that time the profession of architecture became restless with its traditional role as mere "building designers." This has been reflected in the classroom here in the diversity of design course options and lecture-seminar topics.

Some recent examples are programs in historic preservation, architectural programming, adaptable buildings, educational facilities, computer graphics, geodesic structures, socioeconomic factors of built environment, multifamily housing, tension structures, site development, urban design, housing for the elderly and complex functions in architecture. These are in addition to the many offerings that deal with the traditional design of buildings.

The College of Architecture is especially dedicated to the concept of combining community service and education, simultaneously serving immediate public needs for design assistance, while preparing men and women for the constraints and ambiguities of the "real world" practice of architecture. "Barrio Historico-Tucson," probably the College's best known public service effort, involved a team of 22 students and 2 faculty members who thoroughly researched a neglected historical area in Tucson and produced a comprehensive publication outlining all facets of the problem and proposing real solutions.

Similar comprehensive studies have been conducted recently in the community of Bisbee and in many areas of Tucson, including such outstanding efforts as the Pantano Wash Study, the Auto-Free Zone Study, the Activity Nodes Project and the Southern Pacific Air Rights Study. Professors and students have also lent advocacy assistance to Jerome, Payson, Clifton and Florence through individual consulting and research. The results of many of these projects, along with regular student projects, are regularly exhibited at the University and in the community as a matter of public information.

A highlight of the 1972–73 year was the visit to the campus of the National Architectural Accrediting Board. Its visit resulted in an extremely favorable report and a full term continuation of the College's accreditation through 1977–78. Another important event of the year was the annual meeting on the campus of the National Convention of the Association of Student Chapters of the American Institute of Architects.

The College's faculty today is marked by a willingness to participate in team-teaching, to have a number of teachers involved in one given project. The faculty's relative youth should also be emphasized. This means that they seek innovation, are flexible in their attitudes and methodology, and generally continue to grow as scholars and mentors. The continuing close relationship between the College, the architects of Arizona, the construction industry of southern Arizona, and the community-at-large, should be stressed. The College's tradition of public service was continued and strengthened during 1972–73.

a *Mr. Robert E. McConnell*
Dean of the College of Architecture

b *Geodesic dome model prepared by architecture students*

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THE COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

The College offers at both undergraduate and graduate levels professional education in business and public administration. This is combined with cultural and interdisciplinary work in other colleges of the University. In addition to work toward these professional degrees, the College prepares students in the related disciplines of economics and geography so that they may elect to graduate with a liberal arts degree instead of a professional business degree.

The College educates and trains for the State of Arizona, accountants, economists, financial analysts including specialists in real estate and insurance, geographers, personnel and production managers, marketing personnel, and urban planners as well as generalists in business administration. It also trains students for work in such public management areas as corrections, law enforcement, public recreation, and health services.

The general organization of the College designed to achieve the above goals was largely established by Dr. Shaw Livermore, former Dean of the College from 1957 to 1963. Areas of especial interest to adult audiences within the categories listed above include income taxes, real estate brokerage, risk management, office administration, collective bargaining, arbitration, and others.

Although its growth in terms of student enrollment has not been as dramatic as that of certain other colleges, it is the second largest college on campus. There are more than 3,500 students in the College, of whom 400 are graduate students. Admission standards have been significantly tightened. The College has been fully accredited within the past decade. Its faculty has been marked by both qualitative and quantitative growth. During the past five years there has been virtually a complete turnover in top departmental and administrative positions. Many well-known scholars have been attracted from all over the country to head the various disciplines in the College. There are more than a hundred faculty members in the College today.

Faculty members keep in close touch with the business community in Tucson, the State of Arizona, and the entire country. A limited number of senior faculty, particularly those in "professional specializations," are nationally known. Among these are Hollis Dixon in income taxation, Helmut Frank in energy economics, and Nestor Roos in risk management, to name only a few.

Faculty members are called upon for their expertise by many Arizona businesses. Representatives of these and other firms attend business seminars and conferences held on campus. This is highlighted each year by the annual Executive Development Conference which is attended for ten days by thirty or more top executives from all over Arizona and the West.

The Division of Economic and Business Research is both the research and service arm of the College. It maintains and develops statistics of all sorts of Arizona's economy, makes this information available to pertinent business leaders, and publishes monthly the *Arizona Review*, a journal devoted to political, economic, and social studies of Arizona and the Southwest.

a *Dr. Nestor R. Roos*
Professor of Finance, Insurance and Real Estate

b *Recent attendees at annual*
Executive Development Conference

THE COLLEGE OF EARTH SCIENCES

Earth sciences are concerned with the very complex processes which formed the earth and are continually modifying it. These include the composition and structure of its rocks, and the evolution of animals and plants as revealed through fossils. Thus these sciences shed light on the origin, development, structure, and dynamics of our planet. In doing so, they often reveal the secret locations of substances essential to our civilization — water, metals, and fuels. By telling us of these processes which modify the earth's surface, earth sciences also contribute to an understanding of man's physical environment, pointing the way to more effective use of the land.

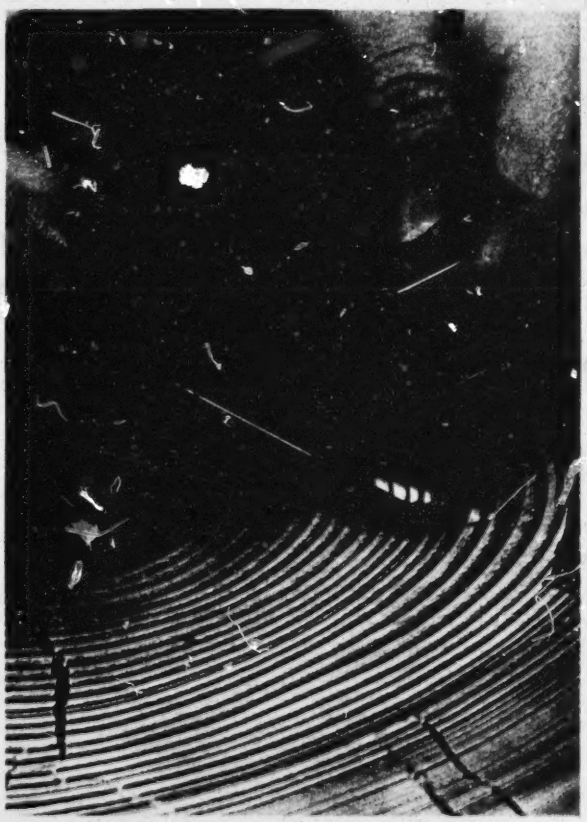
Earth Sciences, the University's newest college, was founded in 1971. It consists of four closely related units: the Department of Geosciences, the Department of Hydrology and Water Resources, the Laboratory of Tree-Ring Research, and the Office of Arid Lands Studies. The first two of these divisions are essentially instructional, offering courses and degrees on all levels. All four units involve considerable research of a highly sophisticated nature. For example, the Department of Hydrology and Water Resources attracted in 1972–73 more external support in terms of dollars than its State support.

The objectives of the College are to train coming generations of experts for service in industry, government, and education; to conduct research that provides new knowledge into the earth and its resources; and to provide technical advice to local governmental bodies through service of various types. As man's needs for resources steadily rise and his environmental concerns increase, the need for skilled manpower, new knowledge and public service also increases. Other colleges and units within the University also deal with major components of the planet earth in their academic and research programs. Strong relationships are maintained between those groups and the College of Earth Sciences.

To support its teaching and research, the College has a variety of specialized equipment and apparatus, and maintains an extensive collection of modern and prehistoric tree-ring specimens, a comprehensive pollen-spore reference set and systematic mineral, rock, ore, and fossil reference specimens. Its Museum of Mineralogy is one of the finest in the West and is open to the general public.

Programs of instruction are augmented at all levels with field trips in Arizona. This State contains a great diversity of natural features and climatic zones that make it a superb outdoor laboratory for students of earth sciences. The summer field program for geosciences majors is operated from the University-owned El Coronado Ranch in the Chiricahua Mountains of southeastern Arizona, and the summer field course for hydrology majors is conducted from Thatcher, Arizona.

The College stands on the very frontiers of vital, exciting, new knowledge. Its Department of Hydrology and Water Resources, the only such department in the country, enjoys not only national, but international acclaim. The College itself now engages the teaching and research efforts of some 50 faculty members, many of them nationally recognized. It has an enrollment of 425 students, the majority of whom are in its graduate program. The activities of the University in the area of earth sciences are complex, advanced, sophisticated, and hold exciting promise for the future.



a *Dr. Laurence M. Gould*
Professor of Geosciences
President, American Association for the Advancement of Science (1965)

THE COLLEGE OF EDUCATION

Since its founding in 1922, the College of Education has trained thousands of teachers for Arizona and the nation. Although the College has always educated these schoolteachers, it now prepares also counselors, librarians, supervisors, rehabilitation personnel, school psychologists, and administrative officers for schools and community colleges. During the past decade it has enlarged its activities, particularly in the area of graduate programs for educational administrators and other education specialists.

In the process of this curriculum enlargement, there has been significant progress toward establishing quality research and service programs. The development of these new programs is indicated not only in the organizational development of the College, the employment of nationally known faculty, and research productivity, but also in the amount of outside funding which has been secured by the College. During the past five years, research and service efforts within the College have brought to the University grants equal to or exceeding the entire State allocation afforded the College for all purposes. This funding itself is a viable index of the effectiveness of the College's programs.

Students desiring to become teachers must spend their first two years taking broad cultural, humanistic and scientific courses. They are required to achieve junior status before being permitted to enter the College and enroll in professional education courses. During 1972–73 there were almost 3,000 students in the College of Education with approximately 1,000 of these working on graduate programs. This number of enrollees has more than doubled during the past decade. There are some 150 faculty members now, many of whom have been attracted to the College in the past several years because of its increasing excellence.

The College's curriculum has not only been enlarged but also strengthened in recent years. An example is the establishment in 1970 of a Graduate Library School. This School educates persons for careers of all sorts in library science: in academic, public, special, or school libraries. More than 200 students are enrolled in a special program leading to the master of library science degree.

The University Rehabilitation Center is a comprehensive unit providing not only academic programs but also service and research. The Center has provided leadership in the development of such curricular endeavors as the vocational evaluation master's degree; a unique alcohol specialist program (M.S. degree); and an undergraduate major in rehabilitation which helps meet the challenge of manpower shortages in community services.

An unusually effective program in the College is that of special education. This is concerned with teaching those who work with children that deviate markedly from the norm in physical, mental or emotional characteristics. There is no faster growing area in education than this. The College offers an undergraduate major in teaching the mentally retarded. Graduate programs are available for those wishing to work with the behaviorally disordered, physically handicapped, visually handicapped, deaf-blind, and those with learning disabilities. Other areas of graduate emphasis here are special education administration and special education resource teaching.

A significant development during the past two years has been the establishment of the Multicultural Education Center, concerned with the development of programs for Mexican-American students and for Indian students. Currently there are many special Indian education programs as well as those for students who have a background or interest in Mexican culture.

College faculty members work almost daily with virtually every school district in Arizona. The College's Early Childhood Education Center and Leadership Training Institute have been attended by professionals from all over the nation. Among its research and service activities are: the Bureau of School Services, the Arizona Center for Education Research and Development, the Teacher Certification Program, and the Rehabilitation Center. These agencies and others within the College have attracted outside funding totaling millions of dollars in the past few years.

a *Dr. Robert Paulsen*
Dean of the College of Education

b *Dr. George Leshin*
Professor of Special Education

c *Dr. Donald C. Dickinson*
Director of the School of Library Science

THE COLLEGE OF ENGINEERING

Engineering serves human needs and desires through adaptation and control of energy, material and information. Engineering education has a dual responsibility: first, to train students in the state of the art, transmitting the ever-increasing fund of applicable knowledge and understanding; and second, to generate new knowledge and improve techniques, whether motivated by intellectual challenge, economics, or ecological sensitivity.

The College of Mines and Engineering was organized as one of the University's three major divisions in 1915. The College of Mines and Engineering was divided into two separate colleges in 1940. Despite a lack of rapid growth in engineering enrollments throughout the country, total engineering enrollment here has increased 15 percent in the past ten years. Although the College recognizes the need for persons with a bachelor of science degree only, its graduate enrollment has increased 72 percent in the past decade. The advent of new programs during the sixties produced a change in type of degree awarded by the College.

Reflecting changes in the nation's requirements, emphasis moved to the new fields of aerospace engineering, nuclear engineering and engineering mathematics with many students majoring in computer applications. Environmental problems and the search for answers in the pollution area increased. Traditional programs were maintained in the College, but new programs in nuclear, systems, and industrial engineering were developed to serve the requirements of a growing economy. Increasing emphasis was placed on graduate degrees as the need developed from industrial and governmental users of engineering developments.

Graduate study options in biomedical, materials, and power systems engineering are most recent developments. Engineering professors at the University maintain close contact with engineering and business firms throughout Arizona and indeed the nation. Many outstanding engineering conferences are held regularly on campus. A selected few examples of these include the Reliability Engineering and Management Institute, directed by Dr. Dimitri Kececioglu, Professor of Aerospace and Mechanical Engineering. This ten-day conference is attended by experts from the United States and many foreign nations.

Other meetings are the Roads and Streets Conference, conducted by Dr. Rudolf Jimenez, Professor of Civil Engineering and Engineering Mechanics, also Director of the Arizona Traffic and Transportation Institute; and the Interactive Computer Graphics Workshop in Engineering Analysis and Design, directed by Dr. Hussein Kamel, Professor of Aerospace and Mechanical Engineering. This latter conference is also attended by experts from over the world.

The Engineering faculty today comprises many persons with national reputations. In addition to Drs. Kececioglu, Jimenez, and Kamel, this includes such men as Mr. Quentin M. Mees, Professor of Civil Engineering and Engineering Mechanics, whose work on water treatment and waste disposal is known throughout the country; Dr. Douglas J. Hamilton, Professor of Electrical Engineering, who specializes in solid-state electronics; Dr. Granino Korn, Professor of Electrical Engineering, an authority in the field of hybrid computers and minicomputers; and others.

The Engineering Experiment Station is the research and service arm of the College. It receives considerable externally sponsored support, attracting more than $1.3 million in 1972–73. It administers the many service programs of the College including Microcampus, an exciting new development in continuing education originated by the College. Through this program practically any place in Arizona or even the world can be equivalent to University campus residence for instructional purposes. Video-cassettes and other highly sophisticated equipment are used. This program developed by the faculty of the College has already been adopted in several other states. It is merely one example of the exciting research in engineering constantly being conducted by the University.

a *Dr. Granino A. Korn*
Professor of Electrical Engineering

b *Microcampus*

THE COLLEGE OF FINE ARTS

Although the College of Fine Arts was not organized as a separate entity until 1934, certain instruction in the arts began when the University opened its doors in 1891. Today the College includes art, drama, music, speech and radio-television. All its divisions are concerned in one way or another with the art, or science, of communication.

The College has some 1,600 undergraduate and graduate student majors, with more than 7,500 other students registered each semester for courses in the fine arts. In addition to regular classroom instruction, opportunities are provided for studio, laboratory, public performance and clinical service training to all students in the College. Some 120 faculty members, many with national reputations, are responsible for these activities. They use six major buildings on campus, including the beautiful Fine Arts complex.

The instructional purposes of the College are twofold: first, the professional training for prospective teachers, performers, directors, creators, producers, researchers or clinical practitioners in the various arts, or in the area of radio-television or speech; second, the avocational training or experience for general college students interested in cultural enrichment.

The College also has as its purpose the goal of creating a campus and community environment which lifts people above the mundane. No College's instructional programs are more inextricably interwoven with its service and even research activities. Faculty and students alike serve the University, Tucson and Arizona by their participation in concerts, exhibitions, dramatic productions, films, radio and television shows, and other performing activities.

The Department of Art offers a full range of courses in the visual arts: painting and drawing, graphic design and illustration, print-making, sculpture and metalwork, ceramics and photography. It also emphasizes art history and prepares students to become teachers of art education. The University's Museum of Art with its large permanent collections is valuable to art students.

Drama offerings cover all aspects of the subject: these include stagecraft, make-up, lighting, design, costuming, history of the theatre and motion pictures, playwriting, screenwriting, dramatic analysis and criticism, acting and directing for the stage and screen, and drama education. A multitude of dramatic organizations exist for student participation.

The School of Music presents work in all areas of music performance, history and literature, theory and composition, jazz and contemporary media music, sacred music, music education, church music, and conducting. Thirteen major student music organizations and many smaller ensembles as well as faculty members provide a wealth of concert activity throughout the year.

The Department of Radio-Television's academic offerings include creative writing; production-direction; and news, sales and advertising. Students in the Department have ample opportunity to work in the University's full-color television facilities, KUAT-TV Channel 6; in KUAT-AM, a 50,000 watt radio operation; and in the fully equipped film studio of the Bureau.

The Department of Speech Communication is concerned with communication theory, oral interpretation, rhetoric and public address. The Department of Speech and Hearing Sciences offers courses through the doctoral level, emphasizing clinical and research experience in speech pathology and audiology. Close collaboration in this area is maintained with the College of Medicine.

The College cooperates with the Department of Physical Education for Women in offering a bachelor of fine arts degree in dance. Training is provided in modern dance technique, classical ballet, improvisation, choreography, dance history, dance production, rhythmic analysis, and ballet and modern repertory. Faculty specialists in each area supervise frequent public student performances and provide support for productions of the Drama Department and the School of Music.

The future of the College of Fine Arts is directly related to the growing interest of students and public alike in the arts. This strong interest, showing no sign of lessening, has already caused sizeable enrollment increases in fine arts colleges across the land. This is uniquely true at the University of Arizona. Its future in fine arts will be limited only by the support it receives.

THE COLLEGE OF LAW

Although the first University offerings in law were given in 1915, the College itself was not formally established until 1925. Its primary mission today is to train young men and women in the practice of law in Arizona and the nation. The past decade has seen a marked growth in its total programs. The annual graduating class has more than doubled in size. Enrollment in 1972–73 was 476 students.

Admission standards, reflecting the national interest among young people in law as a career and the consequent demand for legal education, have skyrocketed. Last year more than 1,500 students applied for the 150 places in the first year. Many of those denied admission were qualified for the study of law.

The changes in the College's programs during the last decade reflected in some degree the decade itself. The 1960's were marked by a significant growth and change in the law itself. This has been reflected in the curriculum. The basic constitutional law course has been split into four separate offerings. Courses in environmental law, anti-trust and regulated industries, local government law, and state and local taxation have been added.

The complexity of many areas of business law has resulted in new and advanced offerings. Seminars have been added to provide deeper coverage of particular topics. Visiting legal scholars regularly come to the campus for lectures in their specialties. And stronger offerings have been provided in areas of particular interest to Arizona, such as mining and water law, and the law of international trade as it affects dealings with Latin America.

There are now 26 full-time members of the faculty. Although primarily concerned with the training of law students, the College has not neglected its scholarly obligations or its duties to the State. The faculty has produced many significant articles and books. Individual faculty members have achieved national reputations.

The Law College Association was organized in 1967. This generates funds for academic purposes and develops closer understanding between the school and the practicing profession. The College's faculty has been active in continuing education enterprises, in bar association activities, and in lending its services to the resolution of a variety of problems within the State. In support of these activities, the law library has tripled in size over the last ten years. A substantial collection of Latin American materials has been added. This comprises 7,500 of the total 110,000 volumes in the library.

The growth and diversification in the College has made it necessary to make plans for a new law building. The core of this building will be the library. Preliminary planning is directed at making that a resource not only for students and faculty but for the whole legal community of southern Arizona. The College further envisions having in its new facility, functioning trial and appellate courts so that students can be exposed regularly to judges and lawyers in action. It is the hope of the College to improve even more the quality of education and bring closer together all the elements of the legal community.

THE COLLEGE OF LIBERAL ARTS

Since its very beginnings, the University of Arizona has offered work in the liberal arts. These courses were originally taught independently, then organized into a College of Letters, Arts and Sciences in 1915. This in turn became the College of Liberal Arts in 1934. The College today is the University's largest. It is also the instructional heart of the University. No student graduates without completing some courses in the liberal arts.

Teaching of the liberal arts began when the first universities were established in the Middle Ages. For them, these arts were grammar, logic, rhetoric, arithmetic, geometry, music and astronomy. In modern times, the liberal arts include languages, sciences, philosophy, history, and related subjects.

The purpose of preparation in the liberal arts is to produce persons who are thinking, understanding citizens. They should be educated in the truest sense, not merely trained for particular professions. They must be able to speak, think, and write clearly, cogently, and coherently. They should understand the past, including man's contribution to it, know something about the scientific method, and appreciate today's cultural values and moral perplexities.

The person who is the product of this general education should possess the all-around capability of continuing his learning for a lifetime. Although many of the College's graduates go immediately into vocational positions upon completion of their degrees in liberal arts, many others merely use the liberal arts as a foundation for professional training in other areas.

The College of Liberal Arts in its attempt to encourage academic breadth, requires about one-third of each student's total curriculum to be courses in the humanities, social sciences and natural sciences; one-third in a discipline declared as a major; and one-third in electives chosen from the great number of courses offered by any of the colleges that comprise the University. It also requires aptitude in at least one foreign language. In addition to formal course work, the student has available to him individual studies, participation in graduate student and faculty research, field trips, membership in departmental clubs, and attendance at special lectures and cultural events.

The College had 6,561 students enrolled in 1963 with some 890 of them working toward graduate degrees. By 1973, the College had 10,462 students, with 1,472 in graduate programs. A similar increase in the number of faculty members within the College took place during the same decade, growing from 340 in 1963 to 450 in 1973.

No college has made a greater effort to attract teachers of the highest caliber than Liberal Arts. It has attempted to create an academic atmosphere conducive to the study, research and teaching of students who want to learn. This has been achieved in most departments by requiring minimum service on committees, maximum exposure to bright and prepared students, complete research facilities such as libraries and laboratories, and the opportunity for constant contact with outstanding colleagues.

It is here that the University has indeed approached excellence. The acquisition of a top faculty is indicated by the number of first-rate scholars that have joined the College within the last five years. Many of these are professors who previously occupied tenured positions in such institutions as the California Institute of Technology, the Massachusetts Institute of Technology, the University of Michigan, and the University of California at Berkeley. Many are scientists who have memberships in the National Academy of Sciences. Faculty members in other fields have similar status in like organizations. They often bring with them laboratories, libraries and their best graduate students and research assistants. They are well known to the major foundations. Thus their grants and contracts further enhance the general research productivity of the College.

Most important, such a faculty serves as a model for students. These professors, immersed in their work, have an enthusiasm and diligence which become infectious. Students know that their teachers, like themselves, are constantly reviewed and criticized by their peers. They know that these professors are creators as well as communicators of knowledge. The honors and awards received by the faculty; the positions of authority to which they are appointed in national organizations; the acclaim they receive for their books, articles, and other research; the invitations they receive to lecture at the great institutions of the world; all this and more is recognized by sudents as indicative of a superior faculty. These are all measurable, tangible indications of excellence.

The College is an administrative and academic alliance of 22 departments representing disciplines in the life sciences, physical sciences, social and behavioral sciences, and the humanities. Each department has been entirely restructured within the last decade. A few of them are outstanding in every way. The College has come far in the past several years toward the attainment of its goal of excellence. Space limitations permit the description of only a few departments.

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ANTHROPOLOGY

Excellence in anthropology remained a hallmark of the University during the past decade. Yet changes occurred, both in quantity and quality. The most obvious evidence of the changes is indicated by numbers. In 1963 there were 96 graduate students; in 1973 there were 181. The Department in 1963 awarded 6 graduate degrees, 3 of which were doctorates. By 1973 the Department had produced its 100th Ph.D. The past ten years have witnessed a similar growth in undergraduate majors. The size of the faculty also reflects this growth. In 1963 there were 10 faculty members; by 1973 this number had grown to 33. In a quantitative sense then, the Department ranks among the largest in the nation. It is one of the major producers of Ph.D.'s.

Improvement in quality was even more impressive than these obvious quantitative changes. In a field that comprises as much diversity as anthropology, it is important to be able to offer a wide range of courses. The increase in size of faculty has made it possible to bring together a group of scholars with many differing theoretical interests and worldwide experiences. Now the Department is able to provide full coverage for the field of anthropology, to provide a world view of anthropology without sacrificing its reputation for excellence in Southwestern anthropology, and to provide training in theoretical and methodological depth, not possible ten years ago. This has resulted in the Department improving its already excellent national and international reputation.

Traditional strength in archaeology is exemplified by the excavations of Dr. Emil W. Haury at Snaketown, major site of the prehistoric Hohokam Indians of south central Arizona, which has since been named a national monument; the highly successful work of Dr. Arthur J. Jelinek in establishing a basic sequence for the Paleolithic of the Near East through his excavations at the cave of et Tabún in Israel; the continued success of the University of Arizona Archaeological Field School, which completed its 54th season in 1973; and the combined Harvard-Arizona Cozumel project, under the direction of Dr. William L. Rathje, which carried out significant excavations on the island of Cozumel off the east coast of the Yucatan Peninsula.

The reputation of the Department in the field of cultural anthropology has been greatly strengthened during the past decade by several senior faculty appointments. Among the most important research activities are the long-standing research of Dr. Edward H. Spicer on the Yaqui culture of Sonora and Arizona; the participation of Dr. Jerrold E. Levy in the Lake Powell project, a multidisciplinary, multi-institutional project to study the impact of man-made Lake Powell on the Four Corners region; the study of the Iranian elite by Dr. Constance Cronin; and the continuing work of Dr. Keith H. Basso on the Western Apache.

Among the most significant research in this general area is the work of the *Bureau of Ethnic Research*, a subdivision of the Department, concerned with basic anthropological research on problems of importance to the people of Arizona. Its recent work has included an analysis of tribal management and government for the Gila River Pima and a major community study of Douglas for the Border Health Commission.

The *Arizona State Museum* is widely recognized for its research activity in the southwestern United States and for its interpretation of native southwestern culture through its exhibit program. Both its staff and its collections have more than doubled in number during the past decade. Working very closely with the National Park Service and other governmental agencies, it has developed one of the nation's leading programs in public and salvage archaeology. It cooperates with the Park Service in preserving Arizona's archaeological remains. In fact the Park Service's largest and most active archaeological research unit is located on the University campus. The Museum regularly sponsors many exhibits including those from Mexico and throughout the world.

a *Dr. Raymond H. Thompson*
Professor of Anthropology
Director, Arizona State Museum

b *Dr. Emil W. Haury*
Professor of Anthropology
President, American Anthropological Association (1956)

c *Dr. Emory Sekaquaptewa*
Assistant Professor of Anthropology

ASTRONOMY

Atmosphere, location, and history have combined to make the Department of Astronomy one of the strongest in the nation. In April, 1973 its research arm, the Steward Observatory, celebrated its 50th anniversary. The University's 36″ telescope, installed at the campus station of the Steward Observatory in 1923, was at that time the largest telescope in the country which had been completely manufactured in the United States.

Astronomy at the University took two giant steps forward in recent years. Kitt Peak National Observatory, the nation's first national optical, astronomical observatory, was established in 1957, some 53 miles southwest of Tucson. This provided an important impetus to astronomy programs at the University. It brought leading astronomers from all over the world to Tucson. The actual headquarters of the National Observatory occupies a building immediately adjacent to the Steward Observatory and University campus.

The other major event took place in 1960 when Dr. Gerard P. Kuiper moved to the University from the University of Chicago to found the Lunar and Planetary Laboratory. Shortly thereafter, the Catalina Observatory for planetary photographs and infrared astronomy was established. The astronomical research furthered by the Laboratory's activities in the United States space program furnished an equally important impetus to the University's already expanding astronomical activities.

The 36″ telescope was moved from Steward Observatory to the new University site on Kitt Peak in 1963. A 21″ telescope was installed in 1964 at the old 36″ site on the University campus for purposes of instruction and public service. In 1969, the 90″ Ritchey-Cretien reflector, obtained with funds from the National Science Foundation's Science Development Program, was dedicated at the Kitt Peak site.

An even more ambitious project was begun in 1971, the development of a six-mirror telescope, the so-called Multiple Mirror Telescope (MMT). This project, being pursued as a joint effort by the Smithsonian Astrophysical Observatory and the University, is based on new optical developments and in the combination of light beams from different reflectors. The Optical Sciences Center and Steward Observatory of the University are playing a major role in mirror finishing and in the active optics design. The MMT may be the most basic advance in techniques for building large telescopes since the design of the 200″ Palomar reflector forty years ago. When completed this will be the third largest telescope in the entire world.

The Department has been dramatically strengthened in recent years. The number of undergraduate astronomy majors has increased and course offerings have more than quadrupled. Twenty doctoral degrees have been awarded in the 14 years the full graduate program has been in effect at the University. The highly skilled faculty of 15 full-time astronomers also includes persons from the Lunar and Planetary Laboratory. Dr. Aden B. Meinel, formerly director of the National Observatory at Kitt Peak, became head of the Department in 1961. He was succeeded in 1966 by Dr. Bart J. Bok, currently president of the American Astronomical Society. His successor since 1970, Dr. Ray J. Weymann, has been joined on the faculty by many others with worldwide reputations.

Concurrent with the improvement in quality of personnel and facilities has been an impressive record of astronomical research. This has involved several remarkable discoveries and projects. Just a few of these include discovery of the first optical pulsar; discovery of a "quasi-stellar radio source" with a "red-shift" of its spectrum which at the time was far larger than any other known; development of infrared detectors and highly efficient infrared telescopes; theoretical and observational work on a class of extraordinarily bright galaxies with active nuclei; investigation of the properties of a hypothetical hot gas in the early phases of the expanding universe; investigation of the possibility that pressure due to radiation may accelerate material in a variety of objects; and special observation and interpretation of the "carbon stars."

As impressive and exciting as the past several years have been for astronomy here at the University, the next few years hold even brighter promise. Astronomy is now in the midst of an era of explosive and remarkable development. The new facilities and continually improving quality of the faculty who will use them give every reason to believe that the University of Arizona will play a key role in the future development of this oldest yet vital science of astronomy.

a *Dr. Bart J. Bok*
Professor of Astronomy
President, American Astronomical Society (1972–)

b *Kitt Peak National Observatory*

c *Dr. Aden B. Meinel*
Professor of Optical Sciences and Astronomy
Director, Kitt Peak National Observatory (1958–60)

CHEMISTRY

Chemistry at the University made tremendous strides during the decade 1963–73. This is true in analytical, biological, inorganic, organic, and physical chemistry. The Department not only grew in size but achieved considerable progress toward the attainment of true excellence. It became nationally recognized in that decade.

In 1963 the Department consisted of 20 faculty members, 75 graduate students, 10 support personnel, and 30 postdoctoral associates. These last are students from other institutions who attend this University to engage in various research programs. By 1973, the faculty had increased to 35, graduate students to 90, support personnel to 30, and 35 postdoctoral associates were working in the Department. In 1963 the Department had awarded a total of 7 doctorates and 74 master's degrees. In 1973 the 113th doctorate in chemistry was conferred, as was the 178th master's degree.

The teaching and research programs in Chemistry expanded so dramatically from 1963 to 1973 that they simply outgrew their facilities. With a grant of $600,000 from the National Science Foundation, the Department moved into a new chemistry building in 1973. The new facility provides all types of equipment, occupies approximately 80,000 square feet, and was constructed at a total cost of $4,200,000. The actual work of the Department itself was greatly enhanced by a grant of $800,000 from the National Science Foundation through its Science Development program.

All sorts of new innovations are being used in the instruction of chemistry. Closed circuit television is utilized for pre-laboratory instruction in freshman chemistry courses. Computer-assisted instruction is available in other chemistry courses, as are specialized tutorial programs. The freshman program has attracted a good deal of national attention for a number of reasons. Not the least of these is the presence on the faculty of Dr. W. T. Lippincott, editor of the *Journal of Chemical Education*, the largest of all professional journals dealing with the instruction of chemistry.

Outstanding research programs have been developed in Chemistry. The Department has attracted a succession of nationally known scholars. There are particularly strong programs in the areas of high temperature polymers, under the direction of Dr. Carl S. Marvel; physical biochemistry, including studies of lysozyme and biological energy conversion; and analytical chemistry, under the supervision of Dr. Henry Freiser.

The Department has increased its interaction with industrial concerns throughout the Southwest. Many members of its faculty serve as industrial consultants. One profitable interaction with industry has resulted in the establishment of the Atmospheric Analysis Laboratory, started with a half-million dollar grant from the Arizona Mining Association. This has in turn served as a nucleus for the development of the University Analytical Center, used by the entire University community. The Department of Chemistry is now nationally recognized for its strength.

a *Dr. Reuben G. Gustavson*
Professor of Chemistry (1959–1971)

b *Dr. W. T. Lippincott*
Professor of Chemistry
Editor of Journal of Chemical Education

c *Dr. Carl S. Marvel*
Professor of Chemistry
President, American Chemical Society (1945)

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Dr. William R. Schultz
Professor of Oriental Studies

ORIENTAL STUDIES

Oriental studies is the vehicle for instruction relating to the languages, histories and civilizations of the vast and populous regions of the Middle East, South and Southeast Asia, China and Japan. The Department offers undergraduate specializations in virtually all these areas. It grants a master's degree in the study of China, Japan, South and Southeast Asia, and the Middle East. It also offers a doctorate in Oriental languages and civilizations, with a major emphasis on China, Japan, or South Asia.

In the fulfillment of various degree requirements, students have a wide variety of options open to them, including study of the Chinese, Japanese, Hindi-Urdu, Sanskrit, Persian, Arabic and Hebrew languages. All students specializing in aspects of Asian languages and civilizations are strongly encouraged to combine this training with work in such disciplines as anthropology, art history, economics, geography, government, history, linguistics, or philosophy.

Undergraduate instruction relating to Asia was initiated in 1957. The program grew slowly but with a combination of State, private, and federal funds, the pace of growth quickened during the period 1963–73. Grants from the Carnegie Foundation, the Institute of International Studies, and the Department of Health, Education and Welfare, all combined to provide a solid basis for growth and development. The Department expanded from a full-time faculty of 6 in 1963, to 22 in 1973. Throughout this period enrollments in Oriental studies courses have more than kept pace with the growth of the faculty, curriculum and degree programs.

A major asset to the instructional and research goals of the Department is the existence on campus of a fine Oriental studies collection. It is a main division of the University's library, comprising approximately 100,000 volumes, 45,000 in the Chinese language, 27,000 in Japanese, 10,000 in Arabic and the remainder in Persian, Hindi-Urdu, and various other Asian languages. The Chinese and Japanese collections are especially strong, thus making the East Asian component of the Oriental studies collection the largest of its kind between the Mississippi River and the Pacific Coast.

Oriental studies are obviously becoming increasingly important. Students are learning that they simply must know more about the vast area inhabited by two-thirds of the world's population. The enlarging role played by Asia on the stage of world affairs makes work in this department more and more important. Oriental studies at the University without fail is going to increase both in size and excellence.

PHYSICS

The Department of Physics has made striking gains during the past decade. It has been upgraded in many areas, receiving support from the National Science Foundation and other outside agencies. Both its instructional and research efforts make it one of the leading departments in the nation today.

The number of both undergraduate and graduate majors has increased. There were 2,000 students taking physics courses in 1963, compared with 5,700 in 1973. By 1963 there were only 25 master's and two doctorates awarded in physics. The cumulative total today is 110 master's and 88 doctorates. A similar growth has occurred in numbers of faculty. There are now 44 members of the Department, compared with only 17 in 1963.

This increase in the number of faculty has been more than matched by its growth in quality. The Department has initiated a number of new programs in teaching. One of the latest is an open-ended, free tutoring system offered to all students by 30 faculty members. This service is available from 9:00 to 3:00 each day, five days a week. It also maintains a careful advising system for all physics majors throughout their time at the University.

Physics continues to offer courses for non-majors which are specifically designed to fit the needs of students in other major fields. This includes physics courses for architects, nurses, civil and mechanical engineers, musicians, and schoolteachers. This is in addition to traditional courses for biology and pre-medical students.

The excellence of the Department is indicated by the constant awarding of grants for research from outside sources. Only $250,000 from outside funds was given to the Department in 1963. This compares with $1.4 million granted for research from outside sources in 1973.

The Department now has a number of areas in which it is known internationally for its excellence. One such area is atomic physics which maintains its unique excellence in beam-foil spectroscopy, discovered by Dr. Stanley Bashkin in 1963. Physics of solids is another area, especially the study of electronic properties of solids. Other well-known fields include those of high energy physics, quantum optics, nuclear physics, general relativity and electron optics, to name only a few. Nationally known professors include: Drs. Carl T. Tomizuka, Theodore Bowen, Bruce R. Barrett, Henry A. Hill, Royal W. Stark, Marlan O. Scully, Robert H. Parmenter, Alvar P. Wilska, and R. W. G. Wyckoff.

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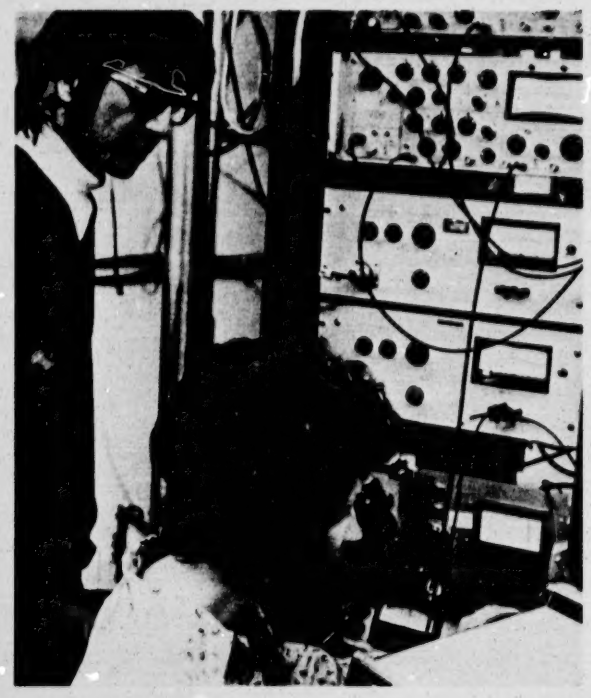

Dr. Carl T. Tomizuka
Professor of Physics

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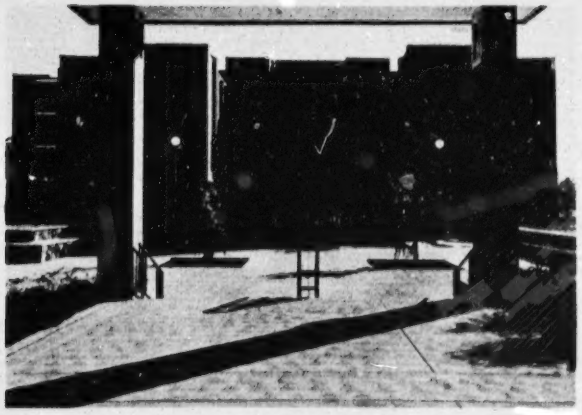

Dr. Neil R. Bartlett
Professor of Psychology

PSYCHOLOGY

Psychology is at one time a scholarly discipline, a scientific field, and a professional activity. Its overall focus is on the study of both animal and human behavior, and related mental and physiological processes. The Department of Psychology made tremendous strides qualitatively and quantitatively from 1963 to 1973, both in the fields of experimental and clinical psychology. Today the Department stands recognized throughout the land as outstanding in virtually every respect. Its emphasis is on experimental, comparative, physiological, social, and developmental psychology, and the psychology of personality.

As the era of activism is apparently ending, students have tended to become more introspective and inclined toward self-examination. Like certain other disciplines, psychology has become an extremely popular subject with the typical student during the past few years. More than 2,500 students annually enroll in the first-year psychology classes. More than 200 of these finally end up as psychology majors by graduation. During the decade of 1963–73, the University awarded 157 master's and 102 doctorates in psychology.

National recognition is obvious. More than a thousand students in 1973 applied for graduate work in psychology. Yet there were only 20 new graduate places to be accommodated. Placement of psychology majors in both universities and various medical facilities is an easy task. Grants from the National Science Foundation, the National Aeronautics and Space Authority, and the National Institute of Health have increased the work in experimental psychology significantly. With the aid of a $600,000 grant from the Department of Health, Education and Welfare, Psychology moved into its own $2.4 million building in 1968.

Psychology staff members work closely with those in the College of Medicine, particularly in the fields of psychiatry and physiology. Departmental membership has more than doubled in the last decade, from 12 in 1963, to 25 in 1973. The faculty abounds with members who have national reputations. Just a few of these are: Dr. Neil Bartlett, specialist in perception; Dr. Robert Lansing, renowned for his work in physiological psychology; and Dr. Richard Coan, expert in the psychology of personality. These professors and others have made the University's Department of Psychology one of the very best in the nation.

SOCIOLOGY

Sociology is one of the behavioral sciences which has become very popular with students in the last several years. As the riots of the 1960's abated, students decided to work within the establishment. They became more introspective, began to study themselves, and took courses in such fields as sociology. For example, 1,800 students attended sociology classes at the University in 1963 while almost 6,500 enrolled in them in 1973.

During the last decade the number of both Sociology faculty members and student majors increased dramatically. A faculty of 8 grew to one of 19. A strong graduate program began. The first doctorate was awarded in 1972. Many innovations were made within the Department. Constant evaluation of teachers was instituted. The introductory course in sociology, formerly given by teaching assistants, now had its lectures given by 12 members of the senior faculty.

Outstanding professors were recruited. Among these was Dr. Robert Nisbet, former dean and vice chancellor of the University of California at Riverside. Another distinguished sociologist recently joining the faculty is Dr. Otis Duncan, formerly at the University of Michigan, a member of the National Academy of Sciences and universally recognized as one of the premier sociologists in the world. Dr. Jack Gibbs of the University of Texas is a new member of the Department. The addition of these nationally-known persons to the faculty has in turn attracted many bright young faculty members and graduate students. Much research in the form of books, articles and other studies is being performed. A number of the faculty, and even graduate students, are now operating the research and evaluation programs of many of the social agencies of the State.

The Department emphasizes both quantitative theory and quantitative methodology. It is performing much of the innovative work now being done throughout the nation in these areas of the discipline. Its substantive areas of strength are social change, social stratification and ethnic relations, criminology, urban sociology, medical sociology, and demography. Sociology as a discipline seems to be switching from verbal to mathematical theories, as did economics in the 1950's. Sociology at the University is among the three or four departments in the nation leading in this development.

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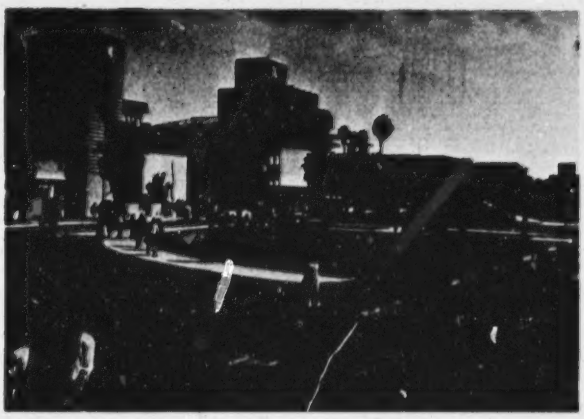

THE COLLEGE OF MEDICINE

The Arizona Board of Regents in 1961 authorized the University of Arizona to develop a college of medicine. Ground was broken in May, 1966 for the Basic Sciences Building, which was completed in September, 1967. The first students in the new College of Medicine entered that same month.

The Basic Sciences Building was the direct result of a private gifts campaign which raised approximately $3 million and was matched by federal funds. Additional major buildings of the Arizona Medical Center were constructed later: a Clinical Sciences Building, a 300-bed University Hospital, and the Outpatient Clinics. These were funded through the sale of self-liquidating bonds and additional matching funds from the U. S. Public Health Service. Construction on these units began in the summer of 1968 and was completed in July, 1971.

The Arizona Medical Center today represents a magnificent complex of four interconnected buildings, located on the northern extension of the University's main campus. These include the Basic Sciences Building, the Clinical Sciences Building, the Outpatient Clinics, and the University Hospital. The total value of this Center is conservatively estimated at $40 million today. It is probably the most modern, up-to-date complex of its sort in the western United States. In close proximity to the Center is the College of Nursing Building, located just south of the Basic Sciences Building.

The admission of 32 students to the first class of the College in September, 1967 was matched by the admission of the same number of students in the fall of 1968. The first full class of 64 students was enrolled in September, 1969. In May, 1971 the degree of doctor of medicine was granted to 31 students. The College has by now produced 126 doctors of medicine, some 98 percent of whom are Arizonans. Since 1971, the entering class has been enlarged to 71 students and a three-year curriculum has been adopted. Thus in 1975 two classes will graduate, providing the citizens of Arizona with a bonus class that year.

The six traditional basic sciences, including anatomy, biochemistry, microbiology, pathology, pharmacology, and physiology, conduct their instructional programs in a modern and unique experimental setting — the multidiscipline laboratory. Traditionally, the medical student migrates from course to course and in this setting achieves little integration of the separate parts. In the new mode, all instruction is carried out in a single laboratory setting that achieves two objectives. First, it permits complete integration of the material of the six academic disciplines; and second, it eliminates the necessity of constructing classroom and laboratory space for each of the participating departments.

Instruction in clinical medicine is conducted through the Departments of Family and Community Medicine, Internal Medicine, Surgery, Psychiatry, Obstetrics and Gynecology, Neurology, Pediatrics, and Radiology. There are some 170 full-time faculty members, many of national renown. The primary settings in which instructional programs are carried out include the University Hospital, the Tucson Veterans Administration Hospital, and the El Rio Santa Cruz Neighborhood Health Center. Individual offerings are now also made available in approximately twelve other hospitals, primarily in the Tucson and Phoenix areas.

All the basic science departments in the College, except Pathology, now offer the Ph.D. degree in the respective basic sciences. Pathology, along with all other departments, offers residency training for students who have received the M.D. degree in order to permit them to focus on specialty medicine, including family practice. There is close liaison between offerings of the College and those of a number of scientific programs in other colleges of the University.

The College also operates the Arizona Regional Medical Program, whose chief task is to conduct continuing medical education for practicing physicians throughout the State. Furthermore, the Arizona Regional Medical Program oversees continuing education courses in all of the other health professions, including nursing, pharmacy and allied health disciplines. Faculty members of the College serve also as faculty for the programs in continuing medical education. They further serve as consultants to committees and institutions throughout Arizona which are attempting to solve the problems of better techniques for distributing health services.

The College faculty is also deeply involved in both basic and clinical research, and service for patients with particular problems. A wide spectrum of problems is under investigation at the Arizona Medical Center at this time. Research involving millions of dollars annually is being conducted. Particular emphasis is placed on cancer and other malignant diseases, and the chronic disabling diseases such as emphysema, asthma, arthritis, and the rheumatic diseases. Direct service to patients is offered through the University Hospital, its emergency rooms, and outpatient clinics.

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a *Dr. Shirley N. Fahey*
Assistant Professor of Psychiatry
President, University Chapter
American Association of University Professors

The Arizona Medical Center bids fair to become one of the nation's most important health facilities. The distinction of its physicians; its ultramodern equipment and techniques; the uniqueness of its research; its physical location in sunny, dry Tucson; the booming economy and population growth of southern Arizona and the entire Southwest, including northern Mexico; its service to the entire State; and the increasing national concern with health problems — all these are merely a few of the factors that guarantee future success for the Arizona Medical Center.

THE COLLEGE OF MINES

Mining education at the University of Arizona is as old as the institution itself. The School of Mines, an original division of the University, was formally organized as the separate College of Mines in 1940. From its very beginnings, the University's assay laboratory tested thousands of samples of rocks for mineral content at cost; short courses were established in assaying, mineralogy and metallurgy; and the faculty was in constant demand for meetings with leaders of this industry.

Mineral and fuel resources are nonliving and therefore nonrenewable within a time frame practical for man's utilization. This sets them apart sharply from man's other natural resources, those derived from agriculture — which are renewable. The recent realization of the shortages of energy and minerals has emphasized the need for the wise development and utilization of our nonrenewable resources. For this reason the most advanced technology and planning methods available must be used in the development of minerals and fuels.

No College at the University is more closely related to a particular industry than that of Mines. The College of Mines is structured around certain industrial needs, rather than certain disciplines. Thus its basic goal is to further technology employed to recover the earth's mineral and fuel resources, and to convert these resources to useful products for man's use. Its students are educated to that end. The College has some 20 faculty members. In 1972–73 it enrolled 366 students, some 70 of whom were working on graduate degrees. Demand for mining graduates far exceeds supply. They readily find employment in the minerals, petroleum, chemical and metals industries. They also fill the needs of government and education.

The College itself consists of three departments. One is Chemical Engineering, which concerns utilizing derivatives of coal, petroleum and natural gas as well as metallic and nonmetallic minerals to synthesize the many fuels, chemicals, fertilizers and plastic materials used by modern society. Another is Metallurgical Engineering. This includes scientific and engineering aspects of recovering metals from ore minerals; and the adaptation of these metals to the shapes, structures and behavioral characteristics which make metals and alloys the principal engineering materials of modern civilization.

The third department within the College is Mining and Geological Engineering. Mining engineering is primarily concerned with recovering metallic and nonmetallic mineral deposits from the earth's crust. Safety and environmental concerns are of paramount importance. Geological engineering is based on the earth sciences as well as the fundamentals of engineering. These disciplines involve both structural and systems engineering as well as the exploration for and production of mineral resources, resource development, underground storage and waste disposal, and the geological aspects of urban planning.

The College itself is intimately involved in the maximum utilization of present energy as well as seeking sources of new energy. Its students and faculty alike are making many studies of current ecological and environmental problems. During 1972–73 it received more than a half million dollars in research grants and contracts for work furthering the technology of mineral, metal and chemical processing. It is making various studies of the nation's copper industry, including one on the present economic impact of the minerals industry on the economy of the State of Arizona.

The College's close affiliation with mining companies of the area is marked by the fact that more than half of the United States' supply of copper is mined within a distance of 125 miles of Tucson. Its graduates hold key roles in all United States mining companies. Virtually all major mining companies are located in Arizona. They in turn both utilize and support the College of Mines. The College has a cooperative program with industry which involves students working certain periods with mining and scientific companies and then returning to the campus for regular instruction. Numbers of students graduate annually under this program.

The *Arizona Bureau of Mines* is a division of the University and an affiliate of the College of Mines. The Bureau is the geologic survey and mineral resource agency of the State of Arizona. Both its research and service activities are beneficial to the State's largest industry. Its activities include the development and dissemination of technical and nontechnical information by individual contact; through the publication of maps, bulletins, circulars, and newsletters; and through contributions to professional publications and conferences sponsored by other scientific agencies.

THE COLLEGE OF NURSING

A School of Nursing was established as a division of the College of Liberal Arts in 1956. It was formally organized as the College of Nursing in 1964. Its purpose is to prepare professional nurses at the baccalaureate level who can provide nursing care to people in a variety of situations. Recent social changes require the professional nurse to have a body of knowledge which must keep pace with scientific advances in every conceivable area. The College's graduate program prepares nurses with clinical specialties for leadership positions in teaching, administration, or as nurse clinicians.

The rapid expansion nationally of health services has resulted in a tremendous growth of students and faculty in the College. There were 24 faculty members in 1963. There are 70 today. An enrollment of 300 in 1963 compares with 925 today, some 75 of whom are in the graduate nursing program. The College moved into a new building in 1967 adjacent to the Medical Center. Yet it is already crowded because of enrollment increases. The demand for college-trained nurses shows no sign of abating.

The undergraduate nursing degree may be obtained by work during four academic years plus one summer session. Some 40 percent of the curriculum is composed of clinical nursing, with actual work being performed for patients. Nursing students are trained not only in the University Hospital but in all other major health care institutions in Tucson. The first two years of the on-campus curriculum involve enrollment in many courses of a scientific nature, including biological sciences, chemistry and pharmacy, as well as a broad range of cultural courses.

Students working towards the master of science degree specialize in the following areas of nursing: child care, community health, medical-surgical care, psychiatric-mental health, and geriatrics. The College is one of the few schools in America which offers geriatric nursing. In a program sponsored by the American Lung Association, there are several nurses taking graduate work in pulmonary disease specialties. Aided by a grant from the Department of Health, Education and Welfare, there is a nurse-scientist program in which 28 nurses are working for their doctorates in anthropology, psychology, sociology, biological sciences, physiology or education.

The College sponsors many workshops and seminars both on and off the campus. During the past several years, some 4,000 nurses in 40 Arizona communities have been reached through the continuing education programs of the College of Nursing. These have been funded by such agencies as the Arizona Division of Vocational Education and the Arizona Regional Medical Program. Need for the College's services of all sorts are boundless. It will continue to grow rapidly as long as health needs keep expanding.

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a *Mrs. Pearl P. Coulter*
Dean of the College of Nursing (1964–1970)

THE COLLEGE OF PHARMACY

The University's School of Pharmacy was organized in 1947 within the College of Liberal Arts. It was granted separate status as the College of Pharmacy in 1949. Pharmacy is one of the primary health professions. Its basic responsibility is the distribution of materials to serve as drugs for the diagnosis, cure, mitigation, or prevention of disease in man or other animals. Pharmacy is also an information bridge between the physician and the patient regarding medicines and health care.

The major changes in pharmacy practice during the past decade reveal a shift in emphasis from product content to patient welfare during drug treatment. Pharmacists are concerned not only with medications but also with the drug histories of humans, including possible drug-induced disorders. They screen medicines for possible conflict with other drugs, with foods, and with specific sensitivities of the individual patients, including allergies, and with such substance abuses as alcoholism and drug addiction.

Ten years ago the College's enrollment was 185 students, 5 of whom were in the graduate program. Today there are 322 students taking courses leading to a bachelor's degree in pharmacy with 31 more taking graduate work, some working for their doctorates in both pharmacy and pharmacology.

Full-time faculty members have increased from 10 to 15 in the past decade. Some 80 percent of the graduates of the College fill positions involving the distribution of drugs and information about drug therapy. The remaining 20 percent serve in other ways or continue their studies beyond the baccalaureate degrees. Some become inspectors, formulators, manufacturers, sales representatives, or they go into colleges of medicine, law, dentistry, or graduate colleges in order to prepare for careers in teaching or research.

The *Arizona Poisoning Control Information Center* is administered by the College of Pharmacy. This nationally known Center maintains a continuous program of data collection of accidental poisonings from the emergency wards of Arizona hospitals. It shares this information with the National Clearinghouse for Poison Control Centers in Washington, D.C. It is designed to aid in the prevention and treatment of human poisoning cases. Its services include day and night telephone consultation with three pharmacologists, experienced in toxicology, who constantly review poisoning cases in human beings.

The newest unit in the College of Pharmacy is the Interdisciplinary Committee on Alcoholism which oversees two special master's degrees in alcohol counseling and service. This Committee also enlists faculty members from the Colleges of Medicine, Nursing, Liberal Arts and other divisions of the University. It devotes much time serving various communities throughout the State, including a number of Indian tribal councils.

The steady development of the College indicates the increasing need for pharmacists in the growing State of Arizona. Pharmacy students here benefit from other University health professions as well as the University Hospital. The College will continue to serve the State as a major health resource.

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THE GRADUATE COLLEGE

Graduate instruction began in 1898, only seven years after the University opened. Although graduate work increased, it was not until 1934 that the Graduate College itself was finally organized under the supervision of a dean. He was assisted by a Committee on Graduate Study representing various fields in which advanced studies were conducted.

Graduate work differs sharply from undergraduate studies. Although the learning process continues, the chief purpose of the student is to extend the boundaries of knowledge, in the process actually adding to the fund of knowledge. Much of the research at the University is performed by graduate students or faculty members supervising the activities of these students.

Today the administration of the Graduate College is the responsibility of the Dean and the Graduate Council, whose membership is broadly representative of the subject matter areas in which graduate programs are pursued. It in turn has the assistance and advice of the Committee on Graduate Study, composed of senior members of the faculty. Its primary responsibility is the maintenance of proper standards and the orderly development of graduate programs.

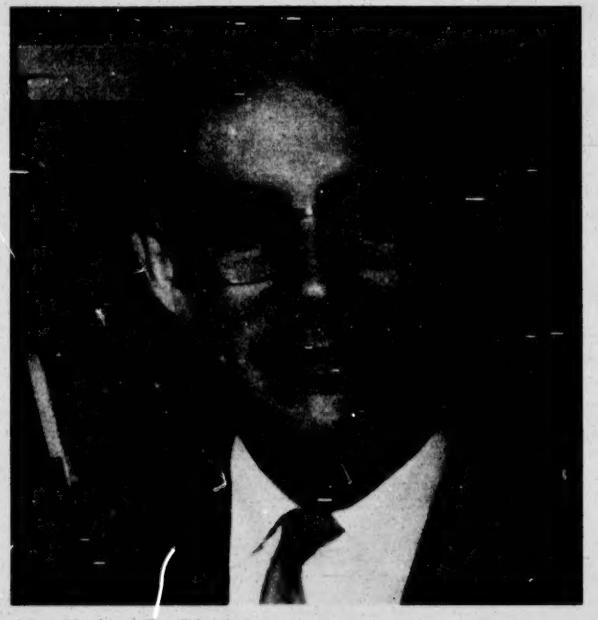
Although the College has grown dramatically in numbers during the past decade, its pursuit of excellence and achievement of quality in some areas has been its most outstanding feature. Many graduate programs have attained distinguished reputations throughout the land. Brilliant teachers and outstanding students have been attracted. In a number of fields, work done on the graduate level at the University is second to none.

Graduate enrollment has increased from 2,778 in 1963 to 5,950 in 1973, an increase of some 114 percent. In 1963, doctorates could be obtained in 40 fields of study and master's in 70 fields. In 1973, doctorates were available in 69 separate disciplines, master's in 119, and the new specialist degree in 3 areas. Faculty members from all departments supervise students working on these graduate programs.

The College attempts to answer special societal demands in a number of ways. This is illustrated clearly by the introduction of new doctorates in business administration as well as computer science, oriental studies, and reading. The University's entire program in optical sciences has developed during the past decade. It is now one of the College's most outstanding and important fields. Doctoral programs developed early in the College of Medicine. They include anatomy, biochemistry, molecular biology, physiology, and pharmacology.

A number of new programs have been introduced at the master's level, primarily in fields where doctorates are not common. Examples are such fields as creative writing, landscape architecture, Latin American studies, English as a second language, urban planning, and nursing. Also new are the master of library science and master of architecture degrees. The College has also introduced recently a specialist degree which occupies an intermediate level between programs for master's degrees and those for the doctorate. Beginning with the specialist degree in educational administration, these programs now encompass some four or five fields in education. The specialist idea has spread to include the optical specialist and the specialist in speech pathology and audiology.

The Graduate College will continue to expand but at a slower rate. Enrollment increases will not be as great as in the past decade. The emphasis will be most heavily placed on the pursuit of excellence. Most departmental graduate programs have significant strengths, and some have achieved international prominence. These include such fields as anthropology, astronomy, chemistry, electrical engineering, mining, optical sciences, physics, and psychology, to name only a few. A general University-wide trend toward increased excellence in all areas will continue.



Dr. Herbert D. Rhodes
Dean of the Graduate College
Chairman, Council of Graduate Schools in the United States (1966)

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THE DIVISION OF CONTINUING EDUCATION AND THE SUMMER SESSION

The Division of Continuing Education and the Summer Session was established in 1959. It was the outgrowth of extension classes and summer offerings, both of which had been conducted by the University since early this century. Today the Division is both an academic and service arm of the University. It answers the needs of great multitudes of people every year through credit and non-credit programs conducted on campus and at many locations throughout the Tucson community and the State of Arizona. Evening classes, extension courses, correspondence classes, conferences and institutes, and summer session offerings comprise the credit-granting programs enrolling well over 20,000 students in a typical year. Another 20,000 are served through various non-credit programs.

Continuing Education is one of the fastest growing divisions of the University. It is dedicated to the emerging concept of lifelong learning. Its student body is a striking conglomeration of young people pursuing their first degrees, homemakers returning to school after an absence of many years, professionals and semiprofessionals updating their knowledge in order to avoid obsolescence, and other motivated citizens acquiring new knowledge so they can make a change in their vocations or find a new lifestyle.

Examples of the tremendous growth of the Division are its night programs, its extension offerings, and its conferences. Ten years ago evening classes on campus, both credit and non-credit, enrolled approximately 2,200 students each semester. In 1973, more than 3,200 were similarly enrolled, a gain approaching 50 percent. Extension programs served 3,350 students in 154 classes, in 21 locations, a decade ago. During the year just ended, comparable figures were 6,200 students, almost 300 classes, and 41 state-wide locations. Especially strong programs were conducted at Davis-Monthan Air Force Base, the Silverbell Campus of the Southern Arizona Law Enforcement Institute, and at the Army Electronic Proving Ground in Fort Huachuca.

The Division makes available to Arizona its Community Services Center. Its purpose is to assist the elective and appointive officials of Arizona governments — State, city, county, special districts and regional councils of government — in more effective performance of their functions. Community service programs are interdisciplinary and focus on intergovernmental relations. They include publications, in-service training, internships, public conferences, and informational services.

There is no faster growing field in continuing education than that of conferences and institutes. Persons by the thousands are returning to campus for programs ranging from one day to eight weeks in length, so that they may keep abreast of the latest developments in this rapidly changing world. This is particularly true in scientific areas. Many engineers and other scientists become virtually obsolete in a few years unless they keep up with the latest technological progress in their fields. Ten years ago this program was just beginning. By 1973 there were 187 conferences held on the campus, comprising 38,631 individuals. Fourteen of these conferences were international in scope, attended by almost 1,700 participants.

The Division has increased the number of correspondence offerings so that persons far away from the campus may take courses for credit. It further is the vehicle by which various departments at the University offer credit by examination to their students. With other University branches, the Division is studying the possibility of granting an external degree in certain areas whereby students actually come to the campus very little if any at all.

Summer session offerings grew in the last decade from 600 courses to almost 800. They served 6,800 students, excluding duplicates, in the summer of 1963 and almost 12,000 ten years later. Many departments offer enough work in the summer so that students may graduate by attending summer-only classes. More and more students are attending the University all year, including summer.

Because of its extreme flexibility, the Division was able to phase in and out a number of service programs as need arose. For many years the Division trained persons on campus for various Peace Corps projects. It conducted for years a Civil Defense program for the entire State. It currently operates a traffic survival school, wholly self-supporting, in conjunction with various city, county and State authorities. With the cooperation of the English Department, it administers a program in English as a Second Language, which enrolled more than 400 students from 26 different countries in 1973.

No division of the University has a brighter future than that of Continuing Education. It is a dynamic force for future growth. The resident day student population, composed largely of young persons just finishing high school, may have passed its peak in growth rate. But the need for lifelong learning on the part of persons in nearly every field is more and more apparent. This adult student population grows each year. All indications are that it will become an increasingly larger percentage of the University's enrollment in future years.

GENERAL DEPARTMENTS OF THE UNIVERSITY

There are several departments at the University which for administrative reasons are not under the jurisdiction of any college. These include the physical education departments and the Reserve Officers Training Corps program. Physical education has been an integral part of the University's offerings since the early part of this century. It is divided into the Department of Physical Education for Women; and the Department of Health, Physical Education and Recreation. With certain exceptions, all freshman men and women must successfully complete one year of physical education.

The Department of Physical Education for Women offers 25 different sport and dance activities. Almost every conceivable activity is available. Not only do thousands of students take some of these physical education courses as part of their general graduation requirements, but many major in women's physical education. The Department grants the bachelor of arts degree; the bachelor of fine arts degree, with a major in dance, given in conjunction with the College of Fine Arts; and the master's degree.

Like other areas of the University, the Department of Physical Education for Women increased both quantitatively and qualitatively in the decade 1963–73. The number of its new graduate programs grew. Its faculty numbered 15 in 1963 and 24 in 1973. It moved into a new facility in 1964, constructed at the expense of $1.5 million. The Women's Physical Education Building is one of the most modern, fully-equipped structures of its sort in the West.

The Department of Health, Physical Education and Recreation offers some 25 activity courses for men students in which to fulfill their one year requirement of work in physical education. Besides offering the bachelor's degree, it also grants the degrees of master of science and master of education. Some 23 of its students received master's degrees in 1973 under the Department's new graduate curriculum. The number of faculty members grew from 19 in 1963, to 29 in 1973.

The Department moved in 1973 into its new facilities, the McKale Memorial Center. This well-equipped athletic plant was constructed at a cost of $8.5 million, seats 15,000 people for basketball and other student events, has a number of class and conference rooms, a wrestling gymnasium, handball courts, and other facilities. It administers the entire range of intercollegiate athletics. A large intramural program involving thousands of students in virtually every sport is conducted for both men and women students by the respective physical education departments.

The Reserve Officers Training Corps has been an integral part of the University since 1920. The School of Military Science and Aerospace Studies consists of two separate departments: the Department of Military Science (Army), and the Department of Military Aerospace Studies (Air Force). The School is under the administrative control of the military coordinator, a civilian member of the University staff designated by the President. Graduates are commissioned as second lieutenants in the United States Army Reserve and in the United States Air Force Reserve. Regular commissions as second lieutenants in the United States Army may be tendered to Distinguished Military Graduates of the Army R.O.T.C.

The general objective of the course of instruction is to furnish leaders who by training and character are suitable for commissioning as reserve officers, a tremendous reservoir of trained manpower for the nation in times of emergency. Other objectives are to develop self-discipline, integrity, a sense of responsibility, and an appreciation of the role of a participating citizen in national defense. Both Army and Air Force military programs at the University have been successful. During the decade 1963–73, 990 graduates were commissioned, 597 in the Army and 393 in the Air Force.

During the latter stages of the Vietnam War, R.O.T.C. programs throughout the land became very unpopular with students. Although there was actually a minimum of hostility to the military at the University, the basic R.O.T.C. program did indeed shift from a mandatory to voluntary status in 1969, with a corresponding diminution in total enrollment. Yet the program remains healthy and is expected to continue its historic role in the preparation of reserve officers.

IV. THE ACCUMULATION OF KNOWLEDGE

THE SIGNIFICANCE OF RESEARCH

It is almost impossible to separate the three chief aims of a land-grant institution like the University of Arizona. Teaching, research and public service are so interrelated that effectiveness in one area almost automatically entails achievement in the others. Yet research is unique in one important aspect. It makes a university different from all other academic institutions. Four-year colleges, community colleges and junior colleges all have the function of teaching, and even rendering public service in varying degrees. But only a university is charged with the special commitment of increasing existing knowledge, discovering new knowledge, and pushing back the frontiers of all knowledge.

Although effective teaching is the primary responsibility of a university, research and scholarship are the only means to achieve this end. Most faculty members are actually recruited because of their ability to pursue research as well as to teach. Instruction on the graduate and professional level, essential to a university, is impossible without research. Even the teaching of undergraduates involves research. Except for a very few areas, it is simply impossible to be an effective teacher without being an involved scholar.

It is difficult to overemphasize the importance of properly-oriented research in determining the quality of life. This is especially true in Arizona. The lifestyle of its citizens as well as its economic health depends upon productive research. The economy of the State is based on mining, agriculture, manufacturing, tourism, retirement communities, and military establishments, to mention the most obvious. Progress in each of these fields is dependent upon advanced technology based on research.

For example, mining ½ of 1 percent copper ore is impossible unless technology is available for its production and extraction through metallurgy to compete with foreign imports and substitute metals. The production of agricultural crops economically is directly dependent upon advanced scientific methods derived from research. These result in new techniques to conserve water, new crop varieties, new fertilizers, new non-toxic pesticides and herbicides, and new machines.

It is desirable that Arizona have a certain type of clean manufacturing. It needs especially solid-state electronic equipment as well as plastics, optical devices and similar products, much of which is spun off from the nation's manned-space program. Tourists must be attracted to the State. They will come only if the air is kept clean, the water pure, and the landscape beautiful. No one will visit an environmentally dissipated Arizona. Many of the University's research programs apply to these matters.

Retirement living, a wonderful new kind of "light industry," depends heavily on the proximity of the most modern health care centers and health delivery systems. Here again the University's research is pertinent. The many military installations in Arizona play an important role in the State's economy. They are dependent almost entirely on advanced technology, much of which is developed in the State.

The University's research effort plays a major part in all these fields, attempting to be responsive to the needs of the State. Research can keep and create opportunities for Arizona's students at home and have these students alert to opportunities for new technology in the State. This can be done only by having a productive and highly visible research effort with which students are constantly working, and research professors who are constantly available in the classrooms and laboratories. Arizona depends heavily on this, and upon the enormous amount of outside financial support it attracts. Research is indeed that unique quality which sets any great university apart.

RESEARCH AT THE UNIVERSITY, 1963-1973

The intense research activity in the United States engendered by World War II declined during the following decade. Perhaps the best bench mark for any cursory examination of United States research, especially that of the past decade, is the date of October 4, 1957. That was the day on which Russia launched Sputnik, thereby starting a technical revolution, the results of which, good or bad, are only now being felt.

Because the only fair measure of the place of the University in the total research picture is the amount of outside financial support it has received for its programs, that measure must be used. It is a good measure for science and technology because all proposals for such programs are reviewed by other scientists in a highly competitive atmosphere. It is a bad measure for the social sciences, arts and humanities, since no really significant federal support has emerged to encourage research in these areas. Yet a trickle of support in these fields has begun to appear these past few years. Figures, as unattractive as they are, must also be used in describing the amount of funds that have been

awarded to the various major divisions within the University.

In the year of Sputnik, academic 1956–57, the total outside research support received by the University was $881,000. Although it is difficult to separate cause and effect, the beginning of the immediate past decade witnessed an increase of this amount sevenfold, to $5.8 million by the end of the academic year 1962–63. During that same period the University ranked 63rd among the top 100 universities receiving the largest amounts of federal funds.

One of the most significant events for the University in the immediately post-Sputnik period was the arrival of Dr. Gerard P. Kuiper in 1960 to found the Lunar and Planetary Laboratory. No history of research here during the past decade, however brief, could fail to mention this. Dr. Kuiper's tremendous energies and distinguished scholarship put the University at the forefront of the dramatic space-related efforts of the sixties.

The end of the first year of the past decade, 1963–64, found the University with a total of $6.2 million in outside support for research. This accounted for 72 percent of our total outside support, the balance being for instruction and public service. Of this $6.2 million, 26 percent was in the agricultural and biological sciences, 57 percent in the physical sciences, and 8 percent in the social sciences, with the small balance scattered throughout the rest of the University.

The year 1964–65 saw the first appearance of a research grant in the new College of Medicine. In 1965–66 the total for the College of Medicine rose to $1.3 million, primarily for new research equipment for the Basic Sciences Building. However, the major grant for that year was the Science Development Program grant from the National Science Foundation for $3.1 million for research in astronomy, chemistry, physics and mathematics. The University was one of the very few institutions singled out for such support, in particular recognition of its great promise.

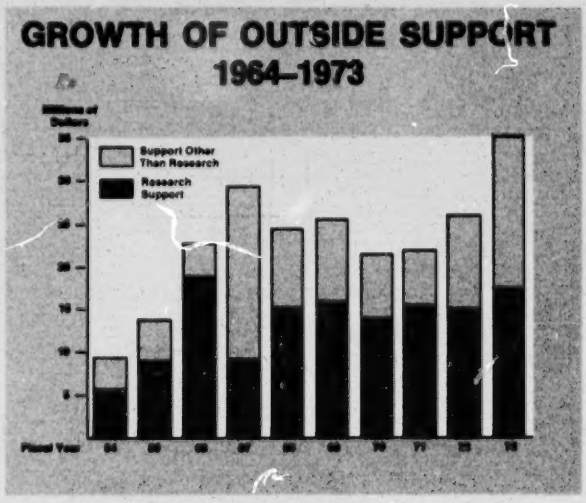
Of the 1965–66 total of $13.5 million, 16 percent was in the agricultural and biological sciences, 72 percent in the physical sciences, and 6 percent in the social sciences. This represents the largest fraction of total University research the physical sciences were to have during the decade. After 1966 there began a steady emergence of research in other areas to achieve a better total balance.

Research at the University reached a total of $15 million in 1967–68. This was highlighted by the $4.5 million granted to the new Optical Sciences Center by the Air Force Space and Missile Systems Organization. This made the University's program one of only two significant efforts of its kind in the country. It lent a special additional capability to the massive optics interest in the University/Kitt Peak National Observatory astronomical efforts.

The year 1968–69 had three interesting features. The first of these was that the National Science Foundation made a second Science Development Program grant of $3.2 million, as a mark of satisfaction in the progress made toward the goals encouraged by the first grant. This brought the total of research support in 1968–69 to $16.8 million, 79 percent of the total outside support. The second interesting feature of the year was that this would be the largest fraction of total support research would receive. Although research support would continue to grow, instruction and public service programs would have proportionately more support in the future. This applied particularly to the Arizona Regional Medical Program and the Family and Community Medicine activities.

A third feature of 1968–69 was the increase in outside funds for research in the health professions. That year witnessed health fields receiving 13 percent of the total, agricultural and biological sciences only 10 percent, education 5 percent, engineering 6 percent, social sciences 4 percent, and the physical sciences falling off to 61 percent, beginning a trend that apparently will become more evident.

The last four years of the decade saw none of the dramatic changes of the first half but a continuation of the trends previously discussed. By the end of 1972–73, the University had been granted $16.9 million in research, which represented only 51 percent of the total outside support of $35.4 million. Grants for research continued to grow but at a slower rate than support for instruction and public service.



Outside funding for these latter two categories probably reflected a greater need for professed "relevance" in University programs. Even funds for research activities whose results were immediately related to social benefit, increased more rapidly than did others. This increased interest in programs more closely related to societal problems is reflected in the distribution of research funds within the major areas of the University. In 1972–73, the physical sciences received only 37 percent of the total, while the health professions had grown to 28 percent. Agricultural and biological sciences remained essentially static at 12 percent but education, engineering and the social sciences had grown to 9 percent, 8 percent, and 6 percent respectively.

Arizona's rank nationally is most significant. The 1972–73 total has increased twentyfold over that of the year of Sputnik, essentially tripling over the past decade. Furthermore, the University entered the decade ranking 69th of all universities in federal support received. Yet the latest figures available, for 1971–72, show that the University ranked 39th and was indeed the 20th of all state universities. This growth in progress in national competition attests to the fact that the growth in quality of research at the University of Arizona is even more impressive than the very impressive growth in quantity.

SPECIAL RESEARCH AGENCIES

As has been emphasized, research activities at the University involve the "creative pursuit of the unknown," thereby expanding knowledge for the benefit of all; assist in the conservation of the natural resources of the nation; preserve and interpret our cultural heritage, particularly that of the Southwest; and help in finding solutions to contemporary societal problems.

A number of agencies play a strongly supportive role to the University's basic educational mission. They are closely related to various instructional departments. However, their activities concern the acquisition and application of new knowledge, especially beneficial to Arizona, as opposed to the traditional classroom transfer of knowledge in the University's regular function. Listed below are only a few of these research units.

The *Environmental Research Laboratory* is a specialized bioenvironmental - engineering group located at a separate off-campus facility at Tucson International Airport. Its primary mission is the innovative development and application of controlled-environment food production systems, particularly in arid regions of the world. Necessarily related activities include research in solar energy, the utilization of industrial waste heat and gases, and techniques of desalinization.

As a result of the Laboratory's efforts in the past decade, large-scale commercial facilities for the production of vegetables are now in successful operation in the deserts of Arizona, California, the Arabian Peninsula and the Persian Gulf. Commercial production of marine shrimp in controlled-environment structures in a Mexican coastal desert is nearly ready for implementation. The Laboratory has received continuous outside funding, including almost $3 million from the oil-producing sheikdom of Abu Dhabi. Increased commercial use resulting from its research activities seems a certainty.

The *Institute of Atmospheric Physics* was established in the early fifties to meet the need in Arizona for an organization which could study the problems of weather and climate, particularly as they apply to the arid Southwest. Particular emphasis has been placed on the study of clouds, rain and snow. Simultaneously, there have been a number of programs dealing with searches for short-term solutions to immediate problems. For example, can rainfall be increased by means of cloud-seeding?

The Institute's activities have included a study of the climate of the entire planet. This climatological data, including detailed information on the Southwest, has been made available to large numbers of people and institutions. The Institute is also a world-recognized leader in the development of remote sensing techniques. Furthermore, a wide variety of optical and radar techniques have been developed for the study of lightning. The Institute's research programs involve faculty who aid in graduate instruction. The University gives both master's and doctor's degrees in atmospheric sciences.

The *Institute of Government Research* concerns itself with political theory, politics itself, American and comparative governments, and international relations. Research includes projects on Arizona government and politics, with emphasis on metro-urban affairs; Latin American governments and politics; world politics, and special topic areas such as policy and environment. The Institute publishes monograph studies, occasional papers, and reports in various areas of political science. It also conducts an annual Arizona Model United Nations, attended by hundreds of high school students. Many of the Institute's faculty members teach in the University's Department of Government.

The *Laboratory of Tree-Ring Research* is an outgrowth of the pioneering tree-ring studies initiated by Andrew Ellicott Douglass at the University in 1906. A division of the College of Earth Sciences,

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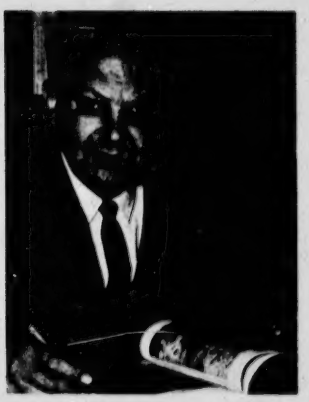

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the Laboratory conducts a unique program designed to utilize millennia-long, precisely dated tree-ring chronologies as an index to past environmental conditions and as a basis for accurately dating prehistoric structures and events.

Computers and other new analytical tools have revolutionized the practice of dendrochronology and the allied science of dendroclimatology. Current research efforts are directed toward the quantification of tree-ring parameters, the establishment of new tree-ring chronologies throughout the world, the understanding of basic tree-growth and environmental relationships, the reconstruction of paleohydrologic and paleoclimatic variables, and the documentation and development of prehistoric chronological controls.

The Tucson general area has been called the astronomical center of the free world. The National Science Foundation in 1957 established the first national optical, astronomical observatory on Kitt Peak, located 53 miles southwest of Tucson. Many telescopes of varying magnitudes, valued at scores upon scores of millions of dollars, have been placed at Kitt Peak during the past fifteen years. The Observatory has attracted astronomers from all over the world. It has helped make the University one of the world's leading institutions in astronomical research. In the forefront of the University's pre-eminence in astronomy has been its *Lunar and Planetary Laboratory,* one of the nation's foremost laboratories devoted to the study of the planets.

The Laboratory was founded by Dr. Gerard P. Kuiper, a brilliant scientist and world-renowned astronomer who came to the University from the University of Chicago in 1960. Since that time the Laboratory has grown to a total faculty and staff of 99 persons. The Laboratory is housed in a building of 50,000 square feet, originally funded by the National Aeronautics and Space Administration. Faculty members of the Laboratory work closely with other University astronomers, a number teaching in the Department of Astronomy.

a *Dr. Gerard P. Kuiper*
Professor of Astronomy
Director, Lunar and Planetary Laboratory
(1960–1973)

b *Dr. David L. Patrick*
Professor of English
University Administrator (1947–1969)

c *Dr. A. Richard Kassander, Jr.*
Vice President for Research

d *Interior of Environmental Laboratory greenhouse at Abu Dhabi*

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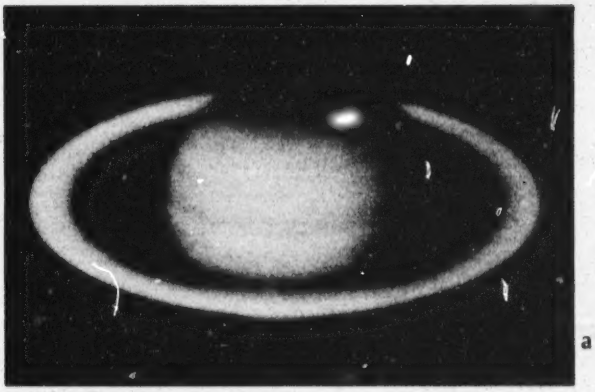
The Laboratory's faculty have made numerous contributions to solar system and stellar astronomy over the past decade. They have served as principal investigators and co-investigators on many NASA space missions. The Laboratory houses one of the largest archival collections of photographs from Rangers, Surveyors, Orbiters, and Mariners used for research. This is complemented by heavy observing programs using ground-based telescopes.

Ground-based observations are carried out at three locations maintained by the Laboratory: Mt. Lemmon, the Catalina site in the Santa Catalina Mountains, and Tumamoc Hill west of Tucson. Joint arrangements for observing as well as operation of telescopes owned by other universities at Mt. Lemmon, is a routine function of the Lunar and Planetary Laboratory observatories.

Plans for a Department of Planetary Sciences within the College of Liberal Arts are now under way. This will bring to the faculty a number of distinguished astronomers who will participate in instructional as well as research programs. It will then be possible to receive both a master's and doctor's degree in planetary sciences. The new department will complement the research role of the Laboratory with this teaching function, while at the same time broadening and diversifying research areas to include new topics such as planetary geochemistry, the solar wind, and meteoritics.

The *Optical Sciences Center* is a research center for applied and theoretical optical technology. University-industry relationships are fostered so that University research advances can be rapidly developed by industry. The University's program is one of only two significant efforts of its kind in this country, and lends a special educational capability to the massive optics interests in the University/Kitt Peak National Observatory's astronomical efforts. Both faculty and research personnel contribute to the graduate curriculum in optical sciences for advanced degree students. The University offers master's and doctor's degrees in optical sciences, in addition to the degree of optical specialist. The Center's extensive facilities are used for research.

Modern optics technology is extraordinarily diverse. Exploration in all fields of optics is being conducted at the Center. Work is being performed on large telescopes and cameras for aerial reconnaissance. Certain large programs currently under way are impressive. The University is just completing a 100" mirror telescope to be installed in Chile



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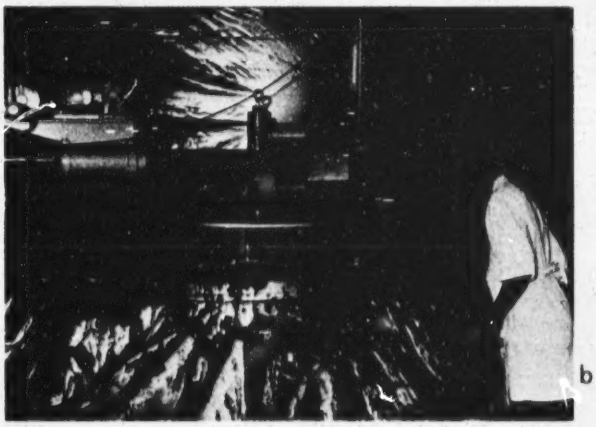

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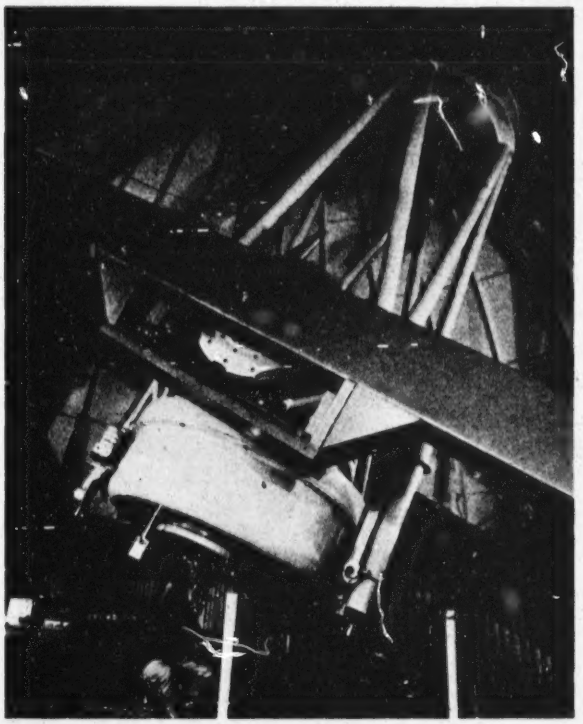

a *Picture of Saturn, Lunar and Planetary Observatory*

b *Grinding lens for Multiple Mirror Telescope*

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which will be second to none in the world for the exquisiteness of its optical surface. It is also producing the mirrors and mirror mounts for the large Multiple Mirror Telescope which will be placed on Mt. Hopkins.

Current research includes the areas of atmospheric optics, electro-optical systems, glass physics, image formation, imaging tubes and devices, infrared detectors, interference and diffraction, laser applications, massive optics, mathematical optics, optical design, opto-mechanical systems, photo-interpretation physics, photoreactive solid state, physiological optics, remote sensing, and thin films.

The *Office of Arid Lands Studies,* a division of the College of Earth Sciences, coordinates the University's Arid Lands Resource Sciences Program. This involves a broad interdisciplinary approach to local and worldwide problems of utilization of arid lands, taking advantage of the warm, dry climate of southern Arizona. Arid Lands Studies receives support from federal, institutional, and State funds, furnishes information to the public and the scientific-governmental community, and administers the Graduate College's unique doctor of philosophy degree in arid lands resource sciences.

Since roughly 30 percent of the land surface of the world is arid or semiarid, research activities in this area are most significant. Many foreign students from arid areas attend the University and numbers of foreign scientists come to the University to participate in, or examine the results of, scientific experiments concerning arid lands. A current example applies to the Jojoba bush. This is an indigenous bush of the Sonoran Desert whose seeds contain a wax useful in cosmetics, candles, and lubricating oil, while the residue meal may prove useful for livestock feed. Under federal sponsorship, the University is now conducting experiments on the Jojoba bean on the San Carlos Reservation for possible commercial exploitation by the native Indians of Arizona.

The *Water Resources Research Center,* an interdisciplinary organization formed as a result of the Water Resources Act of 1964, is primarily devoted to coordinating and assisting water-related research activities of the University, which involve many departments and colleges. Through its research activities the Center's work includes the harvesting of additional water from arid and semiarid watersheds, artificially recharging the ground water aquifiers, evaporation suppression, and urban hydrology. Programs are being developed which reduce loss of life and property from urban storm run-off, and those which utilize flood waters to maintain greenbelts and water-based recreational areas. Communities throughout the State are aided by the Center in both its research and service activities. A periodic newsletter, other publications, and audio-tape material are sent to interested persons and communities throughout the State.

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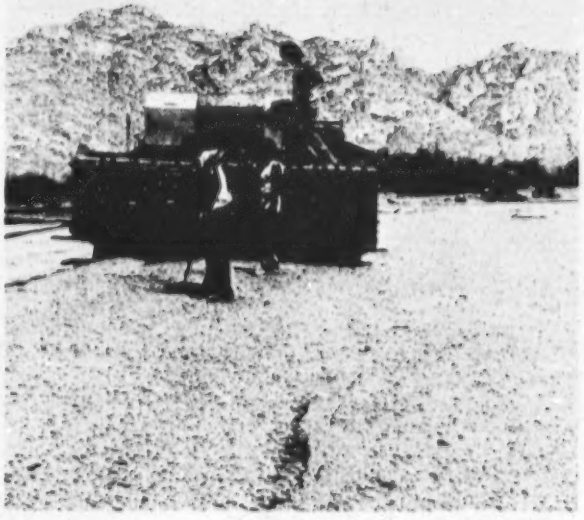

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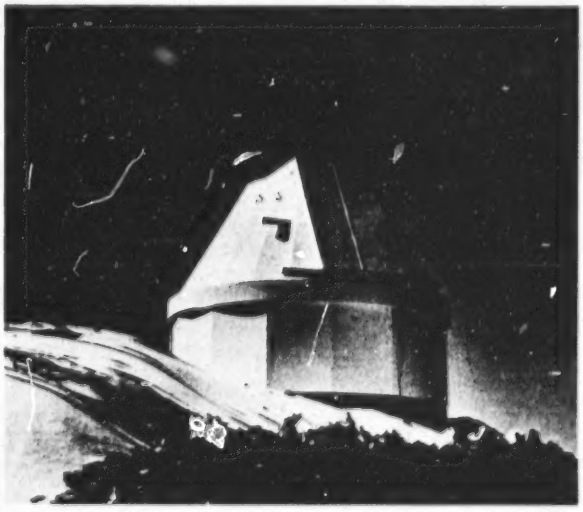

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UNIVERSITY RESEARCH TODAY

Research at the University is so diffused that it is not only impossible to list the thousands of projects under way, but difficult even to hint at the major fields of research activities. In addition to funds given by the State, the level of outside sponsorship of research for 1972-73 was approximately $17 million. This currently involves more than 2,000 projects in 80 departments and divisions. Some research is immediately visible and helpful to the economic situation in Arizona. Other research merely adds to the totality of man's knowledge, with perhaps economic effects coming later.

During each of the past two years a number of divisions at the University have received more than $1 million each from outside sources for research. These include the Colleges of Agriculture, Earth Sciences, Engineering, Liberal Arts and Medicine, as well as the division of Organized Research. The University's entire research program has now reached the highest level in its entire history and shows every sign of increasing.

There is always risk in singling out particular programs for mention. It is tempting to choose the most glamorous ones or those which have achieved national publicity. However, there are a few programs which should be highlighted in a report such as this. These usually entail some significant innovations which might have special meaning for Arizona.

Research activities of the College of Agriculture have typically had the most direct effect on Arizona's economy. During the past year it has developed especially significant programs in determining predictions for seed vigor, seed quality and crop yield; in improving feedlot performance and meat quality; and in the use of remote sensing techniques to develop snowmelt-runoff forecasts.

The University has always had a vital interest in Indian programs, especially in the College of Education, the Department of Anthropology, and the Bureau of Ethnic Research. However, now there is a particularly interesting emergence of programs in some of the science areas not previously identified with the Indian community.

a *Indians harvesting Jojoba seed on San Carlos Apache Reservation*

b *Papago Indian students installing experimental graveled plastic catchment*

c *Mt. Lemmon Observatory*

These include the possible exploitation of the Jojoba bean on the San Carlos Reservation, the development of a five-acre controlled environment greenhouse program with the Quechan Indians who reside on the Fort Yuma Reservation, and the installation of water harvesting systems on the Papago Indian Reservation. An interesting parallel project involves work by University civil engineers in the use of epoxy resins and soil stabilization materials in the preservation of archaeological ruins.

The level of research has increased dramatically in the College of Mines. A potentially important project is the development of a computer program known as "SIMUMIL," which provides greater benefits from existing or planned automation in Arizona copper mills. The College of Education is engaged in several special research projects in the areas of learning disabilities and early childhood education.

The College of Medicine and its associated programs now account for nearly one-third of the sponsored research conducted by the University. Dramatic changes in the amount of support for the College have occurred in the areas of family and community medicine, internal medicine, neurology, pediatrics, physiology, radiology, surgery, and lung diseases.

A unique program in family and community medicine is the Bi-National Nutrition Study, jointly sponsored by United States and Mexican official agencies. This is the first bi-national study of comparable populations on both sides of the border. It focuses on the comparative nutritional status of populations in Douglas and Agua Prieta.

A number of extremely important programs are emerging which combine talents in the College of Medicine and those on the main campus. These include projects in bioengineering, radiology and optical sciences, early diagnosis of cancer by image processing by computer, and neural control of stepping.

It is difficult to keep track of each bit of knowledge gained through research, to place its importance in the tortuous chain which eventually may link up with a development of monumental significance or great economic importance. Even an attempt to keep an accurate log of accomplishment is to lose track of the most significant accomplishment of a viable and visible research effort — the production of many alert and vigorous young scientists, engineers, and scholars, each trying to improve the quality of life and environment for our citizenry.

V. THE APPLICATION OF KNOWLEDGE

SERVICES TO STUDENTS

A student's first task is to receive an education. This is a personal matter. The education is there to obtain, but getting it is entirely up to the student. The University knows this. Yet it makes the job as convenient as possible by providing a host of *student services* which can facilitate this procedure. For example, every student is provided *academic advising* through faculty advisors, heads of departments, or the deans of the colleges. Information concerning the selection of a proper academic program, including both required and elective courses, may be obtained in the office of the dean of the college in which the student is enrolled.

Student life outside the classroom demands attention and concern as part of the learning process. The office of the *Dean of Students,* through its staff and related-service areas, offers advisement in orientation, housing, financial affairs, personal problems, student activities, student conduct, health, and encouragement of new programs to meet each student's needs.

The hub of student activity is the large *Student Union Memorial Building.* It offers a wide variety of places to go and things to eat. Along with its annex, the Park Student Center, it serves thousands of meals daily and has two well-stocked bookstores. It provides nightclub-like entertainment in "The Cellar," art exhibitions, artists' demonstrations, craft fairs, mini-classes, game rooms, the "Palace of Sweets," "Louie's Lower Level," classrooms and banquet rooms, a large theater which shows "old flicks," classics and movie favorites, and many other attractions.

Student Housing includes facilities for various kinds of lifestyles. With some exceptions, all freshmen must live in University dormitories. There are 26 residence halls on campus with more than 4,700 students in them. They are complemented by 14 sorority and 14 fraternity houses, with a total of 1,700 resident students. The University also maintains an attractive apartment complex six miles northeast of its main campus, with 474 units available to married students.

The *Student Health Center* serves both the student's physical and mental health needs. It has a full-time staff of 15 physicians, including 3 psychiatrists, a clinical psychologist, and a trained social worker. It also has scores of other physicians on call. It has a modern, fully-equipped clinic, maintains a 30-bed hospital, and has more than 100,000 visits a year from students.

Closely allied is the *Student Counseling Service.* Here students are offered free professional counseling on educational, personal or career problems by one of eight skilled psychologists or counselors. Reading, study skills programs, and testing are emphasized. A complete, up-to-date library on occupations and careers is maintained.

The *University Placement Service* is used by many students. It aids them in obtaining part-time and summer jobs as well as permanent employment upon graduation. More than 3,000 students were helped in securing part-time work last year. Additional thousands of graduates were aided in gaining full-time positions in education, business, and government.

The office of *Scholarships and Financial Aids* is available to all students. It handles grants of all sorts, including veterans' payments. Many scholarships are granted for academic excellence and others are based on need alone. During 1973 more than 5,000 students were aided by scholarships and loans.

The University has many special persons and agencies to aid its large number of *Minority Students:* Mexican-Americans, Blacks and Indians. Each of these groups has a full-time advisor in the Dean of Students' office. Many programs of various sorts are available in an attempt to assimilate fully these students into the student body.

The *Division of Continuing Education and the Summer Session* provides a number of special services to students on campus. Among these are evening courses, which may be attended by students holding jobs in the daytime; approximately 800 summer classes taken by 12,000 students, many in order to speed their education; courses taken by correspondence and credit earned by examination; and special interest classes which furnish no academic credit but are both educational and popular.

a *Mr. Marvin D. Johnson*
Vice President for University Relations

b *Student Union Memorial Building*

c *Mr. David L. Windsor*
Dean of Admissions and Records

d *Carlos Montoya*

e *John Denver*

f *Mr. Adalberto M. Guerrero*
Assistant Dean of Students

Many *Cultural Activities* are available to students. Scores of dramatic and musical organizations exist to which they can belong. Outstanding plays and concerts are brought to campus. World-renowned performing groups, individual artists and famous speakers appear regularly. These cultural events are sponsored by the University itself or various student groups. Also, a number of museums — featuring art, archaeology, anthropology, Arizona history, minerals, and pharmacy — are located on campus.

There is an *Honors Program* for undergraduates who have distinguished academic records and demonstrate special intellectual curiosity and independence of judgment. This involves considerable independent study granting credit, and in the senior year the completion of a satisfactory honors thesis or equivalent. The Honors Program is eagerly sought by most superior students and considered an enviable goal to attain.

International Programs have been increasingly emphasized since World War II. Students and faculty alike have taken advantage of many opportunities to study abroad. Enrollment of foreign students on the Tucson campus increases each year. In 1973 some 747 foreign students from 84 nations were taking courses at the University, giving the University the largest such enrollment among all institutions of the Rocky Mountain area. Some 151 of these were from Mexico and more than 122 from the Middle East countries. The University's International Programs, including its six-week summer session in Guadalajara, Mexico, are many. They literally stretch around the globe.

Intercollegiate Athletics are an important part of University life. Athletic events constitute one of the few times that large numbers of students are brought together. These give them a sense of belonging, of being a part of the University. Such occasions are an important link with thousands of alumni and other friends of the University. The University, a founding member of the Western Athletic Conference, participates in 10 intercollegiate sports for men and 11 for women. Athletic facilities include the new 15,000-seat McKale Memorial Center and the 40,000-seat football stadium. Its intercollegiate athletic program has been on the upswing during the past several years, as a new athletic director and an influx of new, successful coaches have arrived on the scene.

There is no more important service to students than the dynamically growing *University Library System*. The library is the very heart and soul of any great university. It is the repository of a considerable portion of human knowledge. The University library contains almost 900,000 catalogued volumes, in addition to approximately 500,000 United States Government publications, 400,000 microforms, 100,000 sheet maps and aerial photographs, and numerous other items such as industrial reports, newspapers, musical scores, and recordings. More than 60,000 volumes are added to the library yearly.

The statistics cited above apply only to the main University library. Special collections for students' convenience are scattered throughout the campus: 100,000 volumes in the law library; 70,000 volumes in the medical library; 36,000 volumes in the College of Education library; and others. Along with its collections, the number of library personnel has increased significantly in the last decade. It employs some 300 persons: 60 professional librarians, 100 staff personnel, and 140 part-time students. Because of the great increase in enrollment, the library has completely burst its bounds. Funding for a new library has already been partially achieved. Ground for this new building will be broken in the summer of 1973. It will cost more than $12 million, house some 1.5 million volumes, and when completed will be among the most modern in the nation.

Current library holdings cover all fields of instruction. They are especially strong in anthropology, astronomy and optical sciences, geology, Spanish and Latin American language and literature, and agriculture. For those interested in the history of the West, the Western collections are an excellent resource, particularly on Arizona and the Southwest. The library is a regional depository of United States Government publications, including those of the Atomic Energy Commission and the National Aeronautics and Space Administration. It also receives publications of most American and many foreign societies and institutions. The library is not merely a student service. Scholars and other interested citizens from all over the nation make regular use of its vast holdings.

a *International House*

b *Arizona Stadium*

c *Mr. W. David Laird*
University Librarian

d *Mr. Fred Snowden*
Head Basketball Coach
Tucson Man of the Year (1973)

e *Mrs. Lutie L. Higley*
Chief Social Science Librarian

SERVICES TO COMMUNITY, STATE AND NATION

The *Arizona Bureau of Mines*, an affiliate of the College of Mines, is the geologic survey and mineral resource agency of the State of Arizona. Its chief task is developing, maintaining, and disseminating to the people of the State information relating to mining, metallurgy and earth sciences generally. It accomplishes its goal by investigation and the distribution of information through publications, conferences and personal contacts.

The *Arizona Cooperative Fishery Unit* and *Cooperative Wildlife Unit* are jointly sponsored by the University, the State of Arizona and the Federal Government. Their research programs attempt to meet the increasing demand for information on freshwater fisheries of the Southwest; and to help solve game-management problems which exist because of the large diversity of habitats and game species native to Arizona.

The *Arizona Poisoning Control Information Center* in the College of Pharmacy is a growing part of the Arizona Medical Association's poisoning control program for prevention and treatment of human poisoning. The Center serves a statewide network of treatment centers located in major Arizona hospitals.

The objective of the *Bureau of Audiovisual Services* is to provide media services for the University and for educational activities of the people of Arizona. The Bureau contains more than 8,000 titles of instructional films used both at the University and throughout the State. It aids through its audiovisual and electronic equipment the instructional program of the University and circulates annually thousands of educational films throughout Arizona.

The *Cooperative Extension Service* makes information on agriculture and homemaking available to interested persons in Arizona. The Service is financed by federal, state and county appropriations. It operates through the county extension agent, State and area specialist system, with a staff professionally trained in their specialties; and in the practical application of scientific information to farms, ranches and in rural and urban homes. Assistance in community resource development is provided to community leaders, volunteers and elected officials. During the past decade the Cooperative Extension Service has dramatically extended its scope to meet demands of the changing social scene in youth work, family living and community resource development. Yet Extension still carefully guards its traditional role with agricultural producers and rural families in Arizona.

The *Division of Continuing Education and the Summer Session* conducts extension classes for credit in more than forty statewide locations, attended by more than 6,000 persons annually. The Division also offers a number of correspondence courses taken for credit by students throughout the world. Its Community Services Center sends out specialists from the University periodically to give assistance in training State, city, town and county officials in performing their various governmental services.

The *News Bureau* is the University's public information arm. It handles all materials disseminated to the news media, including copy, tapes and films. During 1972-73 the News Bureau produced more than 4,000 hometown news releases, some 1,500 general news releases about the University, and supervised more than 150 radio and television interviews.

The *Radio-TV-Film Bureau* is at the same time a service arm of the University as well as a laboratory for the teaching of classes in the Department of Radio-Television. In 1967 the Bureau moved into well-equipped facilities located on the first two floors of the new Modern Languages Building. It operates the University's television station, KUAT-TV (Channel 6), which provides color pictures; an AM radio station, KUAT (50,000 watts); a film production department; a campus-wide closed circuit television system; and radio, television and film production facilities to support all these activities. The principal coverage of both the radio and television stations comprises all of southern Arizona.

The office of *State and Community Resources* has as its purpose the expansion of the public service activities of the University as well as the provision of a centralized place at the University for communities to seek assistance. This recently-established office has already aided more than 25 communities in Arizona in many sorts of projects, ranging from park-planning to land-use, and classes for small businessmen to solutions for irrigation problems.

The *Steward Observatory*, primarily a research agency, has for more than fifty years sponsored regular and frequent public lectures involving a wide variety of astronomical topics. Each year the Observatory receives many groups of schoolchildren and others for special tours and information concerning astronomy.

The *University of Arizona Press* is a major research and service arm of the University. Founded in 1959, it is a member of the Association of American University Presses and has more than 300 titles in print. It publishes volumes in fields strongly identified

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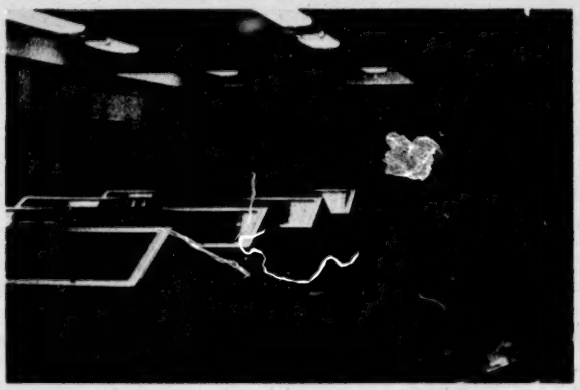
with Arizona. It usually produces 25 new titles a year, scholarly or topical, or both. Its volumes are distributed through buyers and bookstores throughout the United States and in 85 foreign countries.

The Press has won awards for production and design of many volumes and participates annually in hundreds of book exhibits conducted jointly with other university presses. Books with an academic audience are merchandised primarily by direct mail contacts with educators, and given additional exposure at national professional meetings and conferences. Its volumes have attracted widespread, favorable publicity to the University and State, and have added significantly to the vast storehouse of man's knowledge.

The *University Hospital* is Arizona's major resource for clinical teaching in medicine, nursing, pharmacy and other health-related services. It also serves the State with patient care in virtually every field of medicine. More than 200 of its 300 beds are already in operation. The entire hospital provides programs designed to investigate, demonstrate and promote means of achieving health care of the highest quality. Many Arizonans were served by the hospital during 1972–73: 6,241 as inpatients, 50,666 as outpatients, and 18,575 for emergency treatment.

There are many fascinating and valuable museums on the campus. The *Mineralogical Museum* contains mineral and rock specimens found in Arizona and the Southwest. It holds particularly interesting collections of copper, silver and gold found throughout Arizona. The *Arizona Pharmacy Museum* contains a permanent display of territorial-day pharmacy tools, pictures, herbs, bottles, jars, books and supplies. It also has a replica of an early-day "botica," a pharmacy of the old Southwest, complete with appropriate furniture and other equipment.



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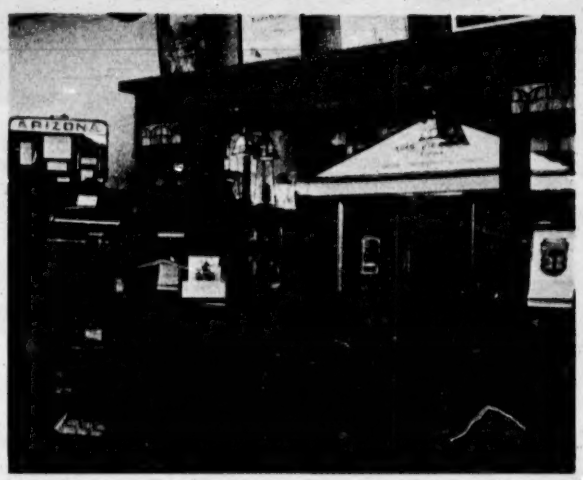

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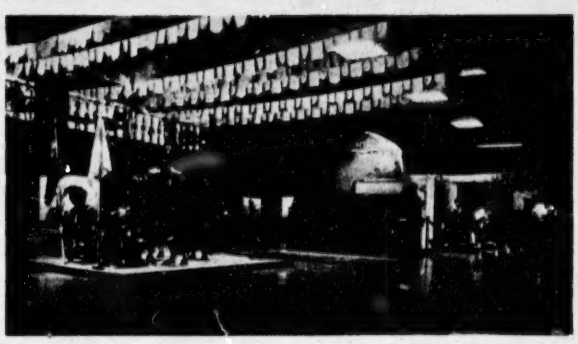

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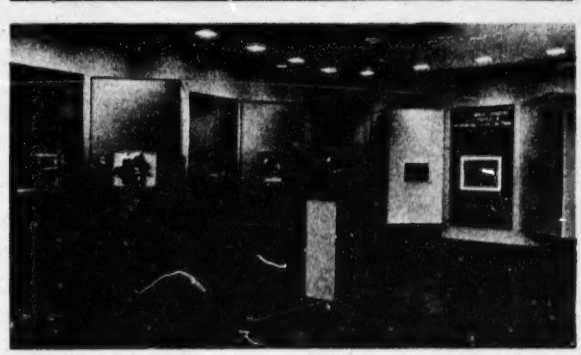

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a *Mr. Marshall Townsend*
Director of the University of Arizona Press

b *Radio-TV Film Bureau*

c *Mineralogical Museum*

d *Pharmacy Museum*

e *Arizona State Museum*

f *University Museum of Art*

The *Arizona State Museum*, founded as a territorial museum in 1893, is an educational, research, and service division of the University. Prehistoric and recent Indian cultures of Arizona and the Southwest are interpreted through permanent exhibitions. Collections number more than 150,000 specimens, including those of the Gila Pueblo Archaeological Foundation.

The *University Museum of Art* offers a rare opportunity for intimate study of original paintings by old masters as well as important contemporary painters and sculptors of Europe and America. This multimillion dollar facility has three large permanent collections: the Samuel H. Kress collection, the C. Leonard Pfeiffer collection, and the Gallagher Memorial collection. It is perhaps the most outstanding university art museum west of the Mississippi.

The priceless treasures in the Museum of Art are used by art students of all levels for instructional purposes. They further provide a cultural overtone to the entire campus community. At regular intervals retrospective exhibitions of distinguished paintings and sculptures are held. Exhibitions honoring such painters as Thomas Hart Benton, Andrew Wyeth, Winslow Homer, Edward Hopper, and Ted De Grazia have been held in recent years. A careful selection of requests for loans has resulted in some of the University's collections being seen in Great Britain, France, Holland, Germany, Italy, Rumania, Australia, India and Japan.

The *University Rehabilitation Center*, a part of the College of Education, is not only used for instruction and research, but provides service to thousands of Arizonans annually. It furnishes comprehensive rehabilitation services to patients and clients referred by physicians and agencies. These services provide clinical experience for both undergraduate and graduate students. Since 1963, the Center has helped some 16,000 Arizona residents become more productive members of their communities. It now serves more than 3,500 persons annually.

VI. A GLIMPSE INTO THE FUTURE

The University of Arizona is one of the fastest growing institutions of higher learning in the nation. It serves a state which is the very fastest growing of all. The University will continue to grow but not as dramatically as in the past decade or two. The national birthrate has leveled off and many universities are now actually undergoing reduced enrollments. Yet this University's growth in numbers will be tempered only by its accelerated quest for excellence.

Quality will be increasingly emphasized in the future. Every effort will be made to recruit outstanding senior and junior faculty members. Each department will be strengthened. Obviously no university can be uniformly excellent in all departments, but a quality institution should be good in all as well as outstanding in some. The University's progress in such diverse areas as physics, astronomy, optical sciences, sociology and medicine — to name a few of the more prominent examples — has already attracted international attention. It is clear that the University is well on its way to becoming one of the nation's distinguished centers of academic excellence.

New methods will continue to be used in an attempt to have students improve their academic performance. Admission to the University will continue to tighten, as it has during the past decade. State community colleges will enroll more and more freshman and sophomore students. This University's enrollments already indicate increases on the upper-division and graduate level, with corresponding decreases among lower-division students. Perhaps the most dynamically growing of all the University's programs are those in continuing education, both on and off campus. The future will see far more adults and part-time students enrolled here.

The citizens of Arizona are to be complimented for their unwavering support of this University and indeed of all higher education within the State. Giving by the State to the University will increase as the institution more effectively achieves its objectives. Its high level of support from outside sources has now reached more than $35 million. This is in addition to its budgeted income of $76 million.

During the 1972-73 fiscal year, budgeted expenditures for the University amounted to $73,748,556. This includes funds for the Medical Center as well as the rest of the institution. Approximately 72 percent of the income came from state appropriations, 12 percent from student fees, and 12 percent from hospital income. The remaining 4 percent came from federal funds and other sources.

Almost 43 percent of the institution's expenditures were for instruction, 11 percent for research, and 4 percent for extension services. Some 26 percent

of expenditures were for supporting services. These include funds for the physical plant, library, student affairs, administration, and other centralized services. Instructional related expenditures amounted to 15 percent of the total. This includes expenses relating to the University Hospital. None of the above budgeted funds of course apply to capital outlay, which involves the construction of new buildings.

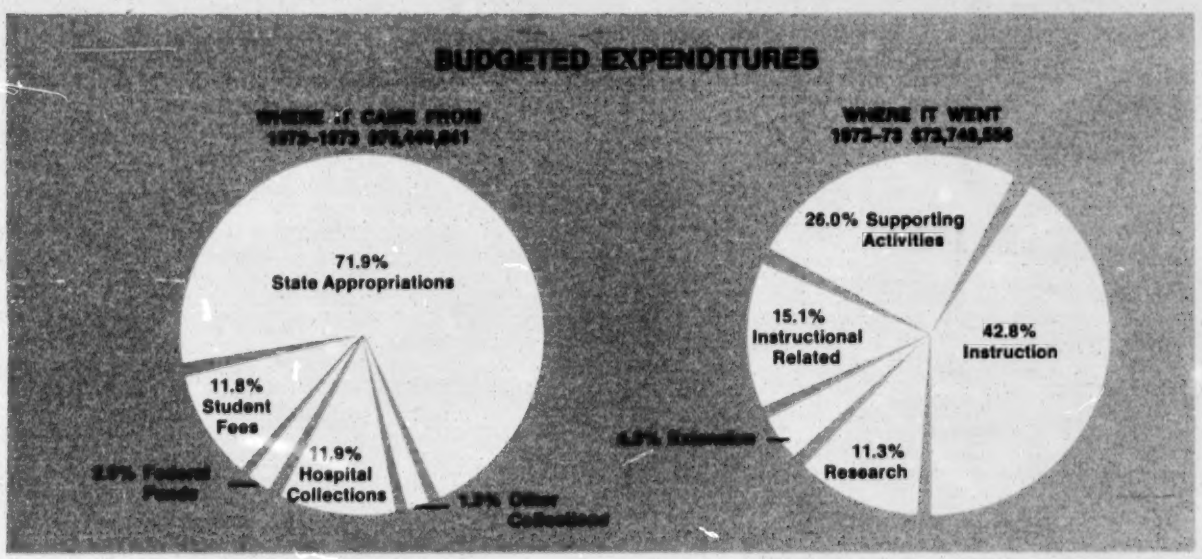
The University has two additional sources of great strength. One is the *University of Arizona Alumni Association*. There are today more than 81,000 former students, living in every state of the union and 104 foreign countries. Some 90 alumni chapters exist in towns and cities throughout the United States and Mexico. Through regular meetings, Homecoming events, and other activities, the Alumni Association is the official link between the University and its former students. Its financial help to the University, much of which is unrestricted, has steadily increased. During 1972 some 6,000 alumni gave $943,000 to the University. More than $171,000 of this was contributed directly through an alumni mail campaign.

Another important source of strength is the *University of Arizona Foundation*. Established in 1958, this has as its purpose the strengthening of the educational and research programs of the University. Six years ago, The Presidents Club was established under the aegis of the University of Arizona Foundation. This comprises a group of donors who have supported the University substantially in a variety of ways. Since its inception, the private funds contributed to the Foundation have enabled the University to realize many needs that would have gone unfulfilled had these funds not been available.

For example, the Foundation gives annually a number of Creative Teaching Awards of $1,500 each to certain faculty members to encourage excellence in instruction. It provides funds for all sorts of educational projects carried on by University groups and individuals. The Foundation was the official organization for raising $3 million in private funds for the establishment of the College of Medicine. It holds title to the Optical Sciences Building on campus as well as the major University computer, and substantial equipment in the College of Medicine.

Future physical growth of the University is certain. Major construction during 1972-73 included completion of the $8.5 million McKale Center and construction of a new Chemistry Building. Partial funding for a new $12 million library was obtained. Construction on that major project will begin in late summer of 1973. The Grace Flandrau Planetarium, financed entirely by non-state funds, will shortly be built on the campus. This unusual building will represent a major thrust toward public understanding of science. A Chest Disease Center will be added to the Clinical Sciences Building of the Medical Center next year. Already some $1.5 million from non-state funds has been given to establish this new pulmonary disease facility. The construction of additional athletic facilities is under way. On the planning board is a badly needed new College of Law building, and other projects.

a *Through Foundation grant, Dr. Hassan Sultan and associate aid Yaquis in preparation of special, inexpensive adobe brick*



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No one can predict the exact shape of the University in the years ahead. The outstanding characteristic of all higher education is change. Each year varies from the previous one. The University's planning must remain flexible, for there is no certainty what the definite outlines of the University for the next decade, or even the next year, will be. One thing is certain however. *The University will continue on the road to academic excellence.* It will attempt to offer the finest possible instruction, to foster the most careful and productive research, to push back the barriers of knowledge, to translate that knowledge into greater service to the people of the State, and thereby increase the quality of life for all Arizonans. This is the master plan for the University of Arizona today and tomorrow.